FEBRUARY 10, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Profit Outlook for '58

A good second half may offset a poor first six months, but '58 earnings won't equal '57's . . . . . *Page 43*

COST CRISIS COMPETITION

Announcing STEEL's campaign to stimulate the search for new ways to lower unit production costs through use of new or improved equipment . . . . . *Page 54*

EDITORIAL—PAGE 41

Machine Bending Grows

Method produces high quality parts from thin and heavy wall tubes, intricately flanged extrusions, and rolled shapes . . . . . Page 79

$1 Billion Year—Maybe . . .

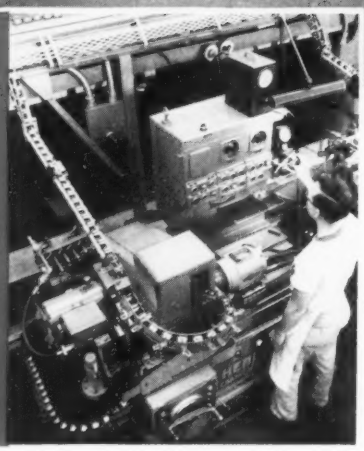
That's the prospect for tool and die makers this year. Costs prompt cancellations of design changes

Page 45

Over 70 Heald Internals precision grind

60 MILLION

Bearing Races a Year at The Timken Company's "AUTOMATIC FACTORY"



These two rows of Heald Model 190 Centri-Matics, on lines four and five of the Cone Finishing Department at Bucyrus, grind bearing cone bores to a tolerance of .0005. Cycle time ranges from 14 to 25 seconds, depending on size and stock removal.

Close-up view of one of the 29 Model 190 Centri-Matics showing conveyorized workhandling equipment. The parts come to the inclined loading chutes from the conveyor belt at top left. As the cones leave the machine through the unloading chute they are demagnetized. The sizing gage on top of machine permits quick checking of tolerances.

From raw tube stock to precision-finished bearing races, untouched by human hands! This—the ultimate in automation—has been successfully achieved at the Bucyrus, Ohio, plant of The Timken Roller Bearing Company. Here, a total of 60 million cups and cones a year are rolling off of America's most fully automated production lines. Sixty million individual bearing races—formed, heat treated, machined and sized in one continuous, fully automatic cycle.

The I.D.s of all races are finish ground on Heald Centerless Internals—43 No. 10 machines for tapered bores of outer races and 29 Model 190 Centri-Matics for straight bores of inner races. These are *standard machines*, fully automatic in loading, cycling and unloading. Hence they were integrated into the automated production line simply by the application of suitable conveyorized workhandling equipment.

For complete information on these or any other internal or rotary surface grinders, just get in touch with your Heald engineer.

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THE HEALD MACHINE COMPANY

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XXVI

This is the twenty-sixth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Cold-Finishing of Alloy Steels: The Cold-Drawing of Bars

Cold-finishing of alloy bars may be divided into two general categories: (1) cold-drawing, where the bars are pulled through a die with no surface removal; and (2) turning and grinding, which removes the surface. We shall consider the cold-drawing procedure in this discussion.

Cold-drawing is the process of pulling a pickled and limed bar through a die, which results in a bright, smooth finish of the section, combined with close tolerances. The alloy bars are prepared for cold-drawing by pickling in a hot solution of dilute sulphuric acid for removal of scale. This is followed by a water rinse, and immersion in a hot lime-water bath to neutralize the effects of the acid, and to aid in carrying special liquid lubricants into the die.

Alloy bars may be cold-drawn under four conditions: *as-rolled*, *normalized* (low-carbon grades only), *annealed* (lamellar or spheroidized), or *quenched and tempered*. These conditions are determined by the grade of alloy steel, the resultant hardness, and the mechanical properties desired for a given end use.

In cold-drawing, the alloy bar is machine-pointed, to reduce the size at one end so it will pass easily into the die opening. Otherwise, the bar is pushed or extruded into the die by an auxiliary device. A die-holder, which can be made to contain from one to four dies, is mounted in an appropriate head assembled across a "draw bench," so that from one to four bars can be drawn at the same time. The draw bench has a bed which accommodates a 4-wheel buggy with jaws that grip the pointed ends of the bars as they emerge from the dies. The buggy has a hook on one end which engages an endless chain, thus pulling the bars through the dies for their entire length.

After cold-drawing, each bar feeds automatically into a straightening machine, and is sheared or "cracker-cut" to length on appropriate machines. Saws are used when the cross-sections of the bars are too large to be cracked or sheared, or when clean square ends are required.

Smaller sizes in the form of coils are drawn on "bull-blocks," or "wire-blocks," depending on sizes, followed by straightening and cutting on special machines.

Specifications with respect to chemical composition, grain size, hardenability, and the like, of cold-drawn alloy steels have been given long study by Bethlehem metallurgists. If you would like suggestions on cold-drawn products, or any other problem concerning alloy steels, our metallurgists will be glad to give you all possible help, without cost or obligation on your part.

In addition to manufacturing the entire range of AISI alloy steels, Bethlehem produces special analysis steels and the full range of carbon grades.

If you would like reprints of this series of advertisements, please write to us, addressing your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa. The subjects in the series are now available in a handy 40-page booklet, and we shall be glad to send you a free copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

SCIAKY

HELPS PUT PROFIT
INTO MANUFACTURING

Sciaky Techniques Provide Strength, Finish and Balance Critical to Profits in Fabricating Cleaning Drums

The advantages of strength, surface finish, weight reduction, corrosion and distortion resistance, leakproofing, etc., can actually be "welded" into a wide range of assemblies when proper resistance welding techniques are used.

A good example is the Western Laundry & Machinery Co., North Kansas City, Mo., manufacturers of dry cleaning equipment for automatic soaking, washing, and spin drying clothing. They adopted Sciaky Resistance Welding Techniques for assembling the cleaning cylinder and other components because *high strength, smooth finish* and *delicate balance* were essential qualities for optimum performance.

Welding Cylinder Assembly

The use of Sciaky Resistance Welding Techniques enables the cleaning cylinder assembly to withstand these difficult operating conditions:

- Rotation speeds exceed 90 miles per hour . . . and a full load of soaked clothing exerts a centrifugal force of 41,600 lbs. on sides of the cylinder. *Sciaky resistance welding techniques provide the STRENGTH required—at least as strong as either of the metals welded together!*
- To protect clothing in cylinder, there must be absolutely no rough surfaces. To verify this, all surfaces are rubbed with a 51 gauge silk stocking after assembly. *Sciaky resistance welds are practically invisible, providing exceptionally smooth surface finishes!*
- The cylinder must be perfectly balanced to prevent flying to pieces in operation. *Sciaky resistance welding virtually eliminates warpage and distortion and adds no weight to assembly!*

Broad Use of Resistance Welding

In addition to the cylinder assembly, Western Laundry uses the same Sciaky Patented Three-Phase Resistance Welder to perform seven other fastening jobs in the manufacture of this dry cleaning machine.

This broad use of resistance welding in a single product results in *improved* performance standards—enables this

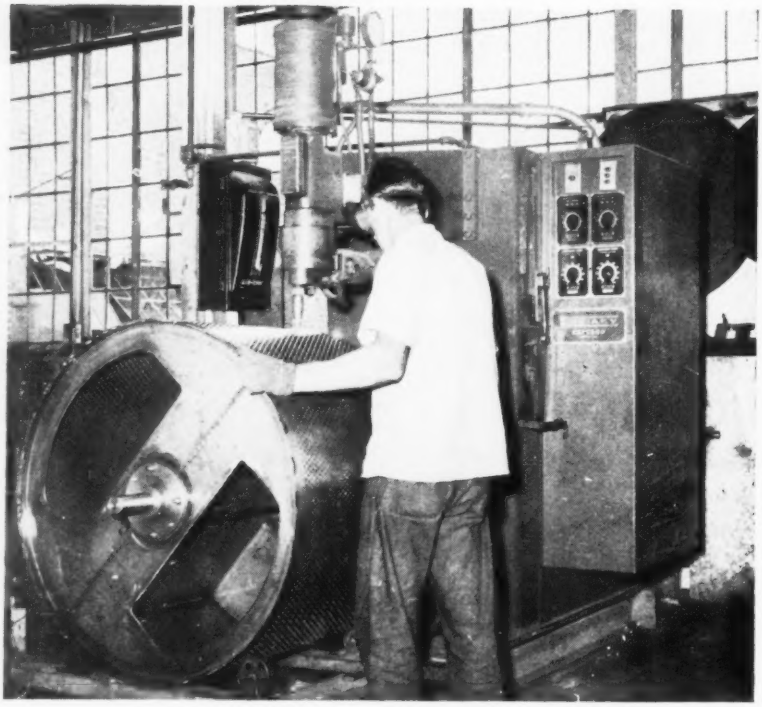


Fig. 1 Joining 12 gauge cold rolled, perforated steel cylinder wrapper to housing. Welding is accomplished at flanged edge of head. The wrapper is formed in two semi-circles. The ends of the semi-circles butt against projecting edge of two partitions. This joint is fused with an arc welding torch.

equipment to handle bigger cleaning loads faster and more profitably. Sciaky Resistance Welding Techniques help Western Laundry back up their claim that these dry cleaning machines represent lifetime purchases.

Formerly, all the fastening jobs were performed by costly riveting and fusion welding methods—which limited the operating efficiency.

Never a Breakdown

Western Laundry reports they have *never* had a breakdown of consequence since they installed their Sciaky resistance welding equipment in 1951.

Information Available

Case histories outlining the successful use of Sciaky Resistance Welding Techniques are available on request. Specific recommendations will be furnished on receipt of an outline of your requirements.

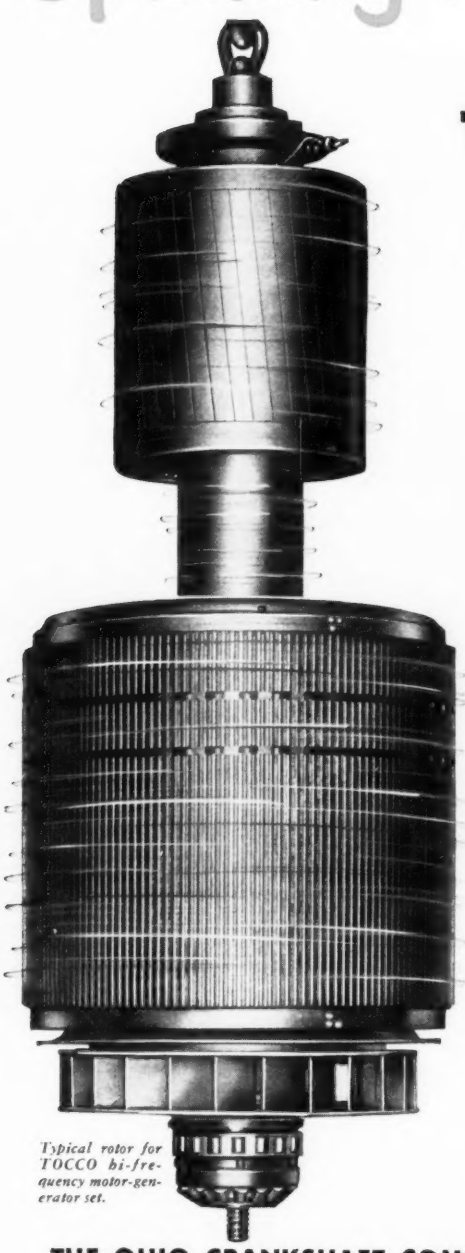
Write today, mentioning the information you would like to receive. No obligation. Sciaky Bros., Inc., 4909 W. 67th St., Chicago 38, Illinois. POrtsmouth 7-5600.

60D

DO YOU HAVE A RESEARCH PROBLEM?

Facilities of the Sciaky Research Division at Los Angeles, California, are available for contract research to answer resistance welding problems. Write for further information and ask for 20 page Research Division brochure.

Spinning for over 15 Years!



Typical rotor for TOCCO hi-frequency motor-generator set.

TOCCO'S VERTICAL Hi-Frequency Motor-Generator Sets

First with Vertical MG Sets—TOCCO*

In 1943 TOCCO designed and built the first vertical motor-generator sets for furnishing hi-frequency power for induction heating applications. Now with fifteen years of continuous production experience, we are far and away the world's largest supplier of these units. Over 1000 are now in service.

Advantages of TOCCO Vertical MG Sets

The large TOCCO vertical type motor generator set has numerous advantages over conventional horizontal type sets. Vertical construction permits the use of very large bearings and also minimizes the hazard of major damage to the set in the unlikely event of a bearing failure. Longer bearing life is achieved due to lower pressure and uniform loading of the bearings. Maintenance is greatly simplified because the rotor can be removed vertically with a simple hoist. Anti-vibration mountings between the base and the MG rotor-stator assembly practically eliminate vibration. No special foundations are needed. Lastly, TOCCO's vertical design cuts necessary floor space to less than one-half the area required by horizontal motor-generator sets.

TOCCO vertical MG sets are available in sizes up to 350 KW and frequencies from 1000 to 10,000 c.p.s.

Only Time-Tested Vertical MG Sets—TOCCO

There are over a thousand TOCCO vertical MG sets in actual service TODAY—more than all competitive horizontal makes combined. Write us for descriptive bulletin giving full details on the advantages and construction details of TOCCO vertical MG sets.

THE OHIO CRANKSHAFT COMPANY

TOCCO

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THE OHIO CRANKSHAFT CO.
Dept. S-2, Cleveland 5, Ohio

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Position_____

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Counting problems and counter applications vary as widely as words in the dictionary. But there's one place where *all* these problems can be met and solved, quickly and at low cost.

That place is the stockroom of your Veeder-Root Distributor. There on his shelves, in the bright red, white and blue packages, are the basic Veeder-Root electrical and mechanical counters that can be adapted to machines and processes in every industry from automotive to zinc die-casting.

Sounds like a "big order." Just try him with an order and see for yourself!
For your nearest distributor, write D. G. Dresser, Veeder-Root Inc., Hartford 2, Connecticut.

Count on
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to help you build business with Mechanical, Electrical & Hand Counters for every industrial application

Everyone can count on
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Hartford 2, Connecticut

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

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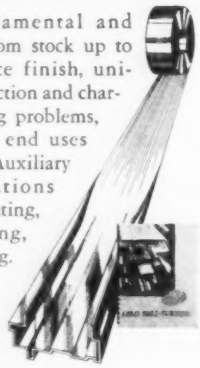
COLD-ROLL FORMING

Structural, ornamental and tubular shapes from stock up to ½" thick. Surface finish, uniformity, stock selection and characteristics, plating problems, production costs, end uses and applications. Auxiliary automatic operations including perforating, notching, welding, coiling, embossing. 88 pages, fully charted and illustrated.

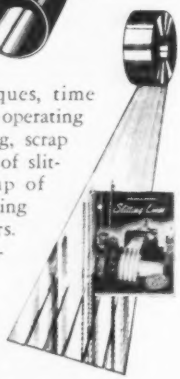


PIPE AND TUBE MAKING

Ferrous or non-ferrous, electric weld, resistance and induction or gas types. Small or large diameter. Tooling, welding, stock ranges personnel training, quality and tolerance control, speeds, power consumption, annual production rating charts. 64 pages, fully illustrated.

SLITTING

Operating techniques, time studies, analyses of operating cycles, coil handling, scrap disposal, selection of slitters and setting up of slitting lines, including coilers and recoilers. Advantages of slitting and how to compute "profit-point". 76 pages, fully illustrated.



Any or all of these books are free upon requests. Send for your copies today . . . Ask for them by title.

THE YODER COMPANY
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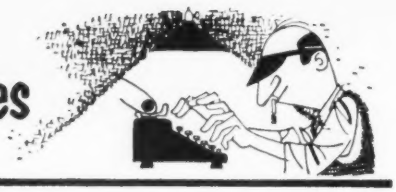
ENGINEERING YODER MANUFACTURING
COLD ROLL FORMING MACHINES

behind the scenes



New Tones from Harp

Market Editor Bill Rooney has undertaken many varied assignments in the course of his long tour of duty with STEEL, but on Monday, Jan. 27, he reached some sort of a climax: On that date, to his own astonishment, he found himself addressing a group of Japanese businessmen, not one of whom could speak a word of English. Members of a small business management study team, the 11 top level executives were guests of the International Co-operation Administration. With their leader, Jun Kashima, president of Oval Gear Engineering Co., Tokyo, two interpreters and a U. S. Government guide, they descended upon STEEL with a view toward learning something about business paper business.

Mr. Rooney's chest heaved as he recalled his experience. "I was pulled off my market reports and ushered into our conference room, and I thought for a minute I had another Pearl Harbor on my hands. I talked for more than two hours. Every time I stopped for breath, the interpreters took my words and turned them into Japanese. Why, I had no idea how I sounded in Japanese before." After a pause he added, "It sort of scares you if you aren't used to it."

Awards Await

The Cost Crisis, as every reader of STEEL knows by now, is created by leveling or shrinking sales volume, greater resistance to price increases, and continuing upward cost pressures. We had a sneak preview of a handsome spread (Pages 54-56) before it went to press. Before the proof was snatched from our hot little fists, we noted that it concerned competition — a nationwide search to highlight the need for intelligent cost cutting. If your company has achieved an important saving in unit production costs through the more efficient use of capital equipment, the editors want to know about it. Your success can bring national recognition to you, your production team, and your company.

Lectures to Lubbers

John Close, circulation manager of *New Equipment Digest*, sister publication of STEEL, keeps a sharp eye on Great Lakes shipping. Indeed, when Johnny isn't proselytizing fast backfield men for Michigan, or talking about the big fish that got away off Ashtabula, he studies the giant ore carriers. Wherefore it was no matter for wonder one afternoon when he rolled into our coop and announced that he had just returned from the Shipmasters' hall, where he had listened raptly to a lecture delivered by Hugh C. Downer, executive vice president, Wilson Transit, and outstanding marine architect.

"What's so wonderful about that?" we inquired. "You're always going to lectures about boats, backs, or bass."

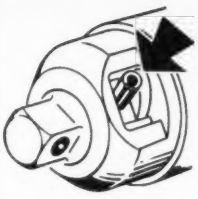
"This was different!" Johnny cried. "A lot of big companies around here are vitally interested in shipping, but many of their employees don't know the difference between a poop bulkhead and a windlass room. So the shipmasters are running a series of lectures, and believe me, after people hear these lectures, everybody will know the difference between a poop bulkhead and a windlass room."

If we can catch that lecture course next week, we'll be there early. We've always had an aching curiousity to learn about bilge stringers and prismatic coefficients, so move over, Johnny: You got company.

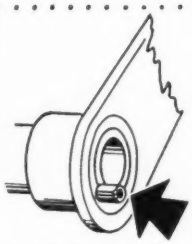
Shrdlu

(Metalworking Outlook—Page 37)

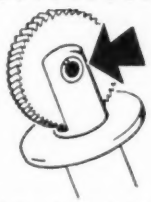
Rollpin® replaces 12 different fasteners



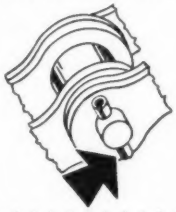
REPLACING A GROOVED PIN . . . in this application, Rollpin serves as a stop pin in a ratchet wrench adaptor. With its light weight and high shear strength, Rollpin functions perfectly . . . cuts assembly costs.



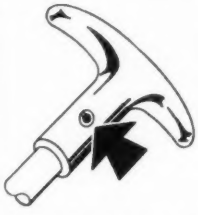
REPLACING A KEY . . . Rollpin demonstrates its ability to do away with precision tolerances, in this heating system damper arm. Faster, cheaper and more satisfactory than previous assemblies.



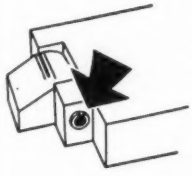
REPLACING A RIVET SHAFT . . . Rollpin serves as an axle for the sparkwheel of a cigarette lighter. No riveting or threading necessary . . . faster assembly. Note flush, clean fit.



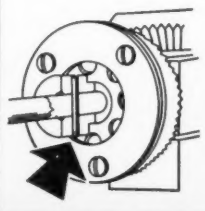
REPLACING A COTTER PIN . . . Rollpin assembly time is shorter, service life ten times longer. Vibration-proof flush fit. Easily removable.



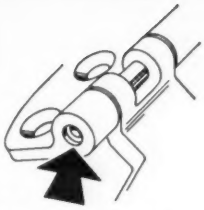
REPLACING A SET SCREW . . . to fasten automobile brake handle a short length Rollpin is self-retained in the hand grip but can easily be driven into over-drilled hole in shaft for simple handle removal.



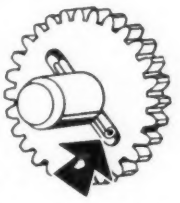
REPLACING A CLEVIS PIN . . . here Rollpin holds firmly in clevis, permits free action of moving member. Rollpin application shown is the plate of a home workshop tool.



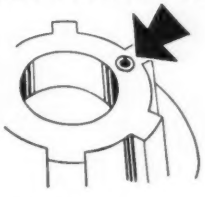
REPLACING TAPER PINS . . . in the assembly of precision differentials eliminated cost of taper pin reamers and the entire reaming operation. Rollpin costs less than a taper pin and installation is cheaper. They remove easily.



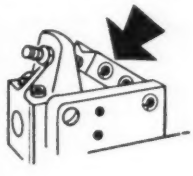
REPLACING A HEADED PIN . . . in this hinge pin application, Rollpin is simply and inexpensively driven in place, greatly reducing assembly costs. Constant spring tension holds Rollpin firmly in place . . . eliminates loosening of hinge due to wear.



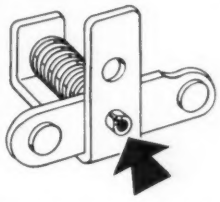
REPLACING A HUB ON A GEAR . . . Rollpin, self-retained in shaft, is simply snapped into molded slot to position sintered gear. This application, by an office equipment manufacturer, effects major savings in assembly. Rollpin's high shear strength is particularly valuable here.



REPLACING A DOWEL PIN . . . Rollpin is used here to prevent rotation of a thrust bearing. No reaming, no special locking. Easily removed. Lowest possible dowel pin cost.



REPLACING A BOLT AND NUT . . . Rollpins act as fasteners and pivots for the linkages in this electric welder. Rollpins may be used with a free fit in outer or inner members depending upon product design requirements.



REPLACING A RIVET . . . Rollpin serves as guide shaft for spring-loaded electrical interlock contacts. This electrical equipment manufacturer reports that rivet failure previously occurred at the clinched end under normal operating impact and vibration.

WHERE CAN YOU USE THIS SIMPLE FASTENER?

Rollpin is the slotted tubular steel pin with chamfered ends that is cutting production and maintenance costs in every class of industry.

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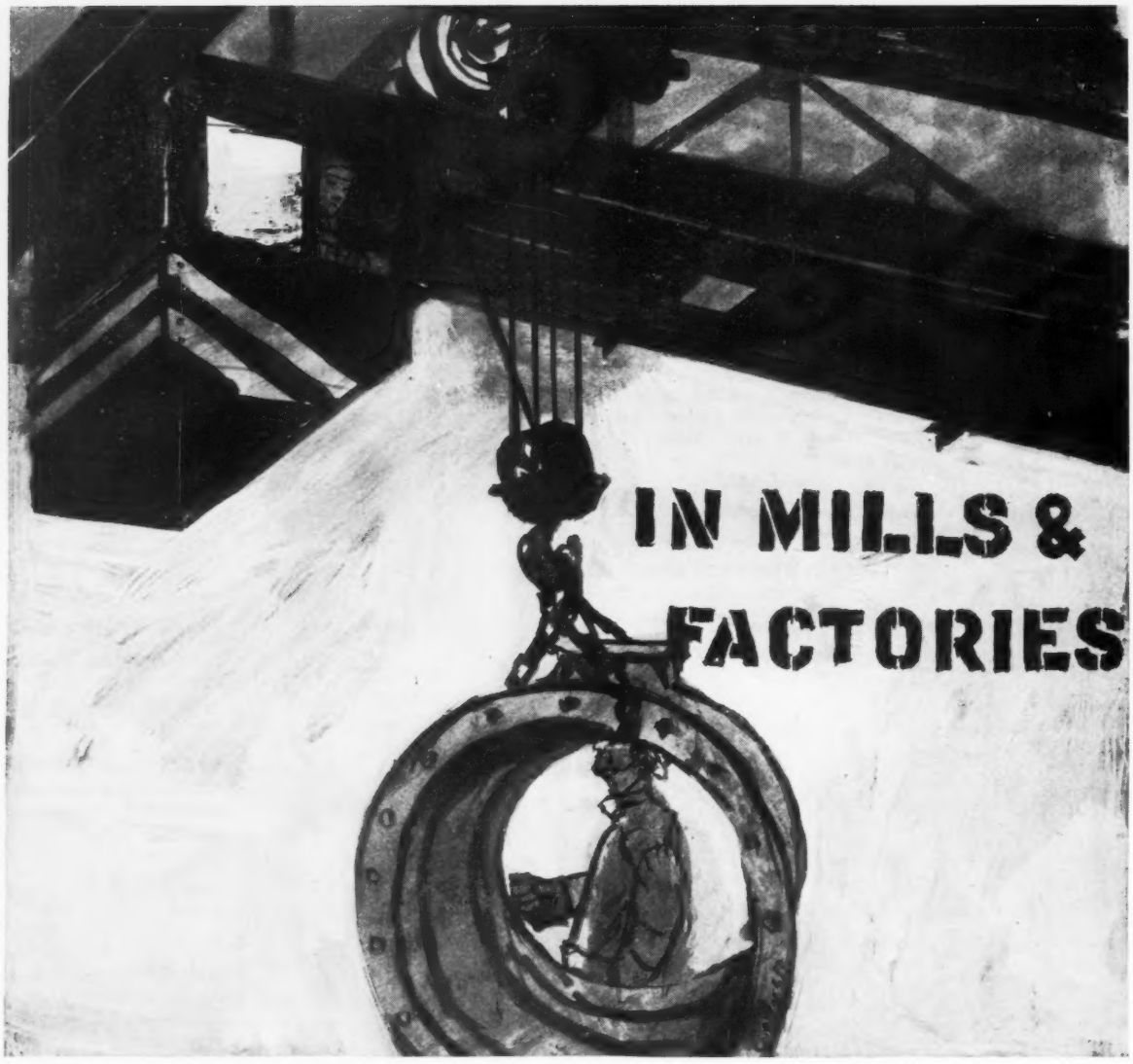
ELASTIC STOP NUT CORPORATION OF AMERICA

2330 VAUXHALL ROAD, UNION, NEW JERSEY



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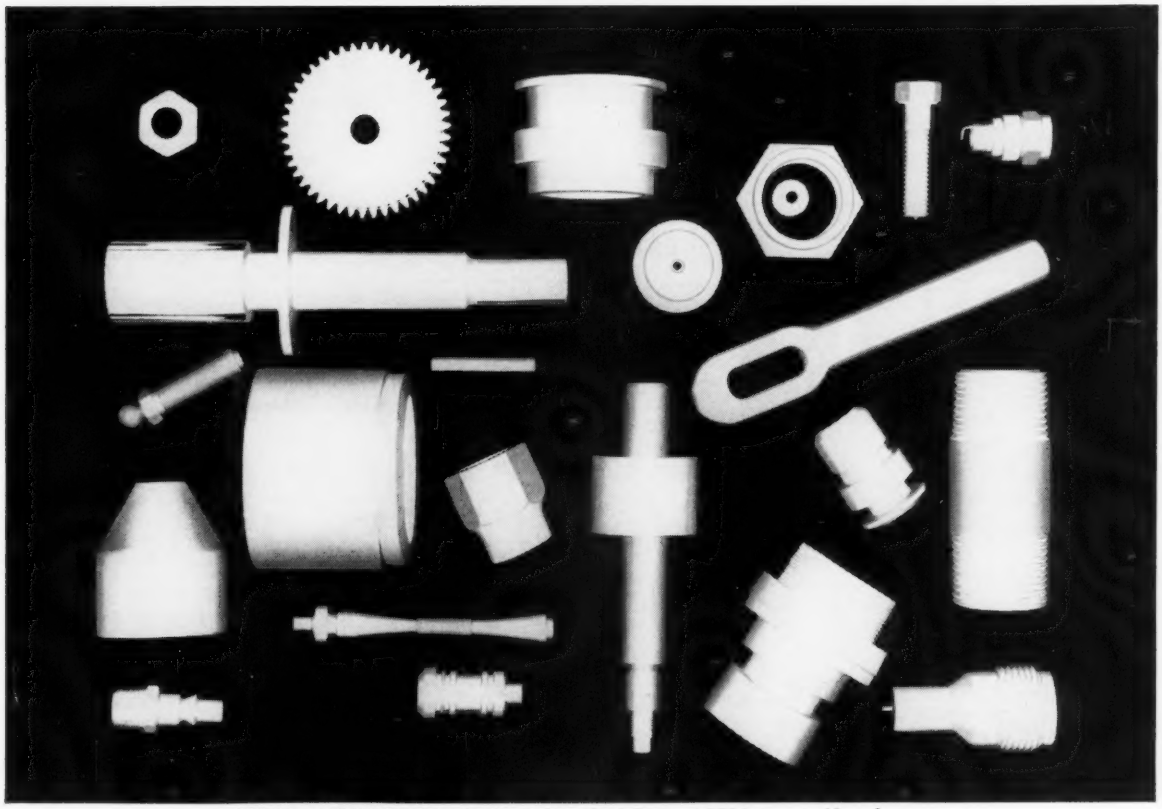

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LETTERS
TO THE EDITORS

Management Costs Out of Hand

Your editorial, "Three Steps to Profit" (Jan. 13, Page 33), interested me. Steps 1 (trim off the fat) and 3 (lower unit production costs with more efficient equipment) virtually coincide with my contentions on the management of smaller manufacturing corporations.

It's my contention that many top-drawer executives don't have the courage to admit management costs have gotten out of hand through laxity, overenthusiasm to be "big," or failure to put economizing measures into effect.

They prefer to keep their directors and stockholders believing management and overhead costs are not out of line while they frantically make efforts to get into a better profit position through outside maneuverings such as: Tax relief through Congressional acts, rulings of manufacturing associations, and price manipulations with competitors.

It's my belief that many executives have come into top-drawer jobs from fields of finance, sales, advertising, or purely production supervision, and they do not have the over-all experience and knowhow to do a good job in top management.

Often they're thoroughly convinced there's no profit possible except through financial manipulation and production volume. To them, a dollar saved is not as good for their reputation as one obtained from pressured production lines. Economy to them might be a so-called dirty word.

Clement L. Kline
Practicing Mechanical Engineer
719 E. 34th St.
Indianapolis

Making Missile for Space Trip

It was a pleasure to find the information on missile fabrication in the Jan. 20 issue. We would appreciate two reprints of the article, "Fabricating the Redstone Missile" (Page 66).

Carl F. Carlstrom
President
Carlstrom Pressed Metal Co. Inc.
Westboro, Mass.

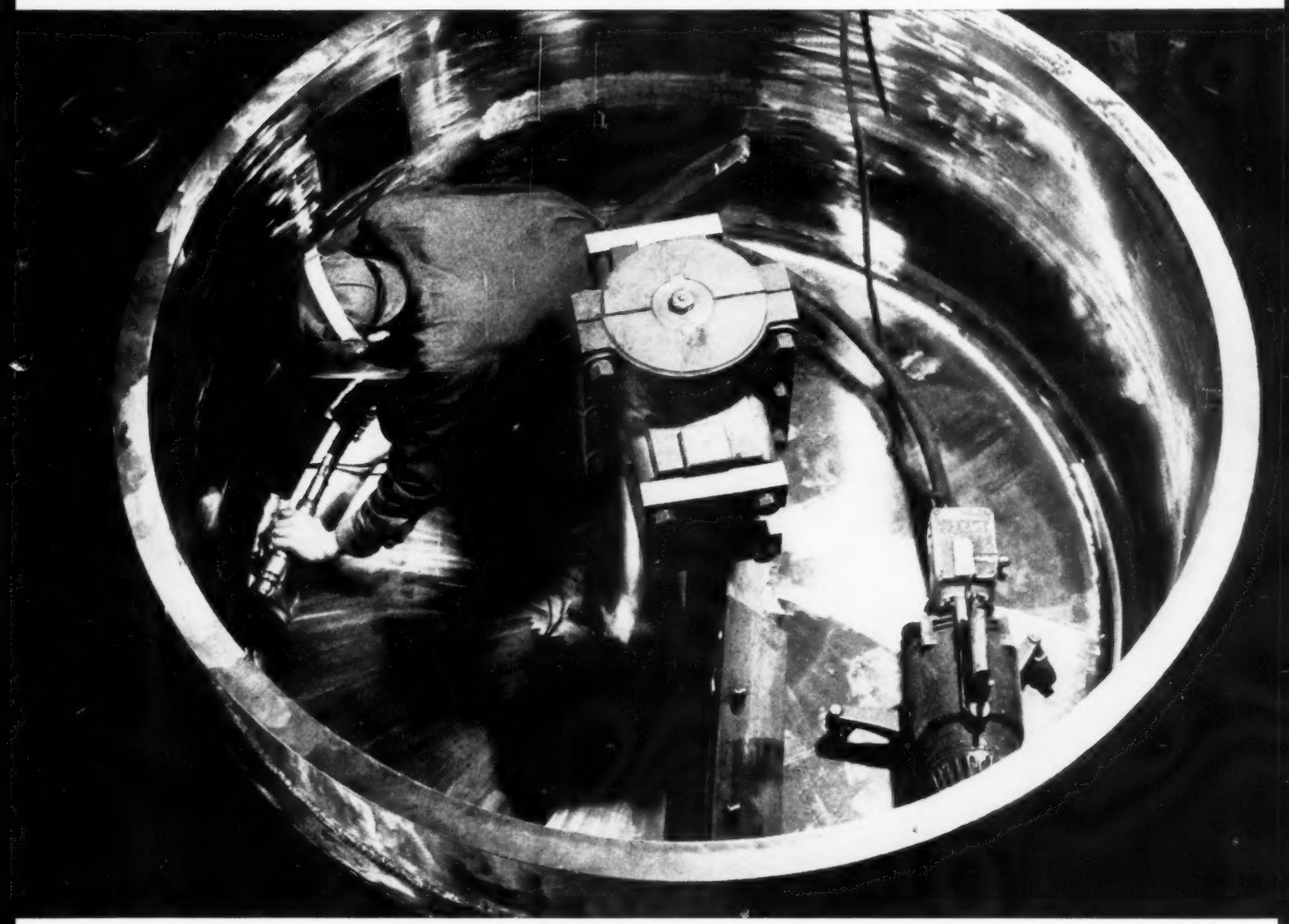
Reader Lauds Facts and Figures

A few days ago I saw a copy of the booklet, "Facts and Figures of the Metalworking Industry" (Jan. 6, Page 159).

The excellent tabulation should save us time in locating information on the metalworking industry and in providing

(Please turn to Page 12)

Stainless Steel grinding and polishing information:



go slow...keep temperatures low

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UNITED STATES STEEL

If you keep Stainless Steel's physical characteristics in mind, you should never have grinding and polishing troubles. Remember these four points:

1. Stainless Steel has low heat conductivity and a high coefficient of expansion. Therefore, keep work as cool as possible. To avoid hot spots, heat tinting and local distortion such as buckling, keep temperatures low. Don't sacrifice surface for time by increasing wheel pressure. For coarse grinding, use wheel speeds of 5000-6000 linear feet per minute. For finer grinding, you can go up to 7000.

2. Stainless Steel is hard and abrasion-resistant. To further avoid overheating, use coolants or lubricants when practicable.

3. Avoid dwelling on any one spot or area. Grind continuously, returning to regrind when the surface has cooled.

4. Never use abrasives too fine for the job. Start with a coarse abrasive and go to successively finer grits. Remember that a fine grit removes more stock when the surface has been roughened by coarse grinding.

Stainless Steel surface finishing and protection is thoroughly covered in our Stainless Steel "Fabrication" book. For your free copy, write on your company letterhead to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

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Our complete facilities, service, and stocks are at your disposal. Call in your nearest Wheelock, Lovejoy representative. He will gladly show you how to get the most benefit out of the services we offer.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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131 Sidney Street, Cambridge 39, Mass.

AGENTS:
Southern Engineering Company, Charlotte, N. C.; Sanderson-Newbould, Ltd., Montreal & Toronto

LETTERS

(Concluded from Page 10)

clues to where additional information can be secured.

I would appreciate a copy.

R. E. Burton
Assistant Director-Marketing
Koehring Co.
Milwaukee

STEEL Is 'Must' Reading

I would appreciate a copy of the article, "Ferrous Castings Stretch Your Dollars" (Jan. 13, Page 70). It is an excellent article on ferrous casting materials and presents useful information for the design and specification engineer.

I consider STEEL must reading and look forward to the weekly issues with considerable interest.

H. G. Taracks
Engineering Laboratory
GMC Truck & Coach Div.
General Motors Corp.
Pontiac, Mich.

Excellent and Timely Article

Please send three reprints of the excellent and timely article, "Have Enough Salesmen?" (Page 35), from the Dec. 30 issue of STEEL.

C. L. Hegtvedt
Commercial Research Manager
Soule Steel Co.
San Francisco

Canadian Wants Labor Article

Please send a copy of your Program for Management article, "Dealing with Workers" (Sept. 16, 1957, Page 119). It will assist greatly in labor relations here because we are much affected by what is happening in the American area.

R. C. Walker
Personnel Director
Winnipeg General Hospital
Winnipeg, Man.

Young Management Training

In your Dec. 16 issue, I came across the good article, "Junior Brass Attend Class" (Page 64). Please send a copy.

R. R. Letsch
Director of Training
John Deere Waterloo Tractor Works
Deere Mfg. Co.
Waterloo, Iowa

Thorough Job on Electrodes

Your article, "Electrodes: '58 Looks Good" (Jan. 20, Page 95), was most interesting. You did a thorough job.

I have a question, however. The sales of welding electrodes as given in your article differ from the statistics listed in your Yearbook booklet, "Facts and Figures of the Metalworking Industry" (Jan. 6, Page 159). Will you explain this difference?

W. H. Hobart Jr.
Hobart Bros. Co.
Troy, Ohio

• *Yearbook figures came from the National Electrical Manufacturers Association. Its statistics cover only the firms who report sales data to them—normally between 80 and 85 per cent of the industry. The article estimate is based on the 1954 Census of Manufactures which lists shipments at 433,694,000 lb. To get our estimates for subsequent years, we plotted the industry's sales growth in each year against this 434 million-lb figure.*

In the spots that count... Homestead Valves are

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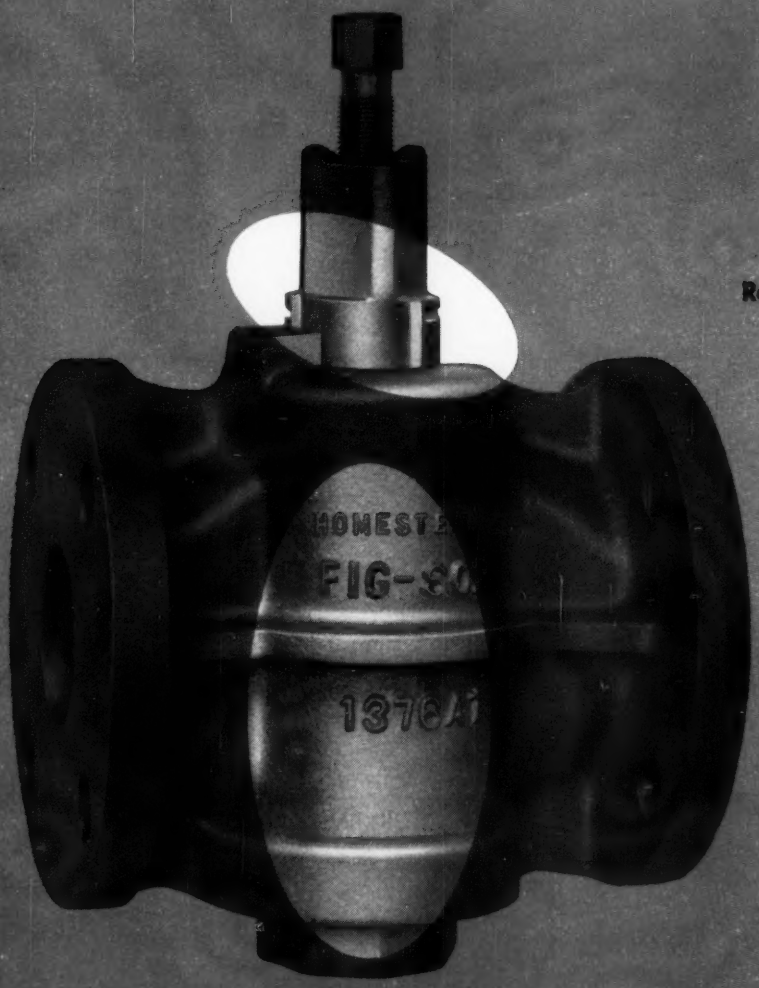
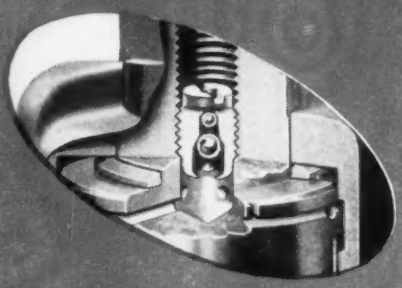
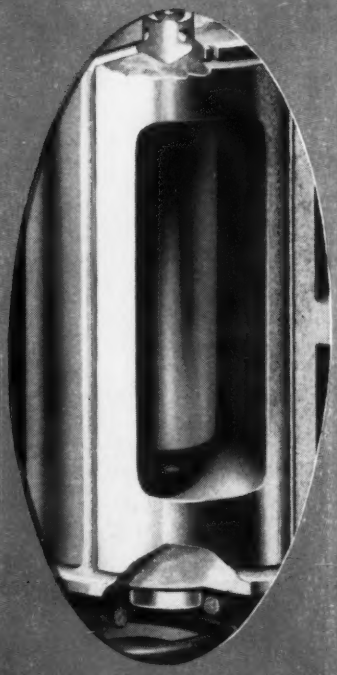




Reinforced Teflon and lubricant seal



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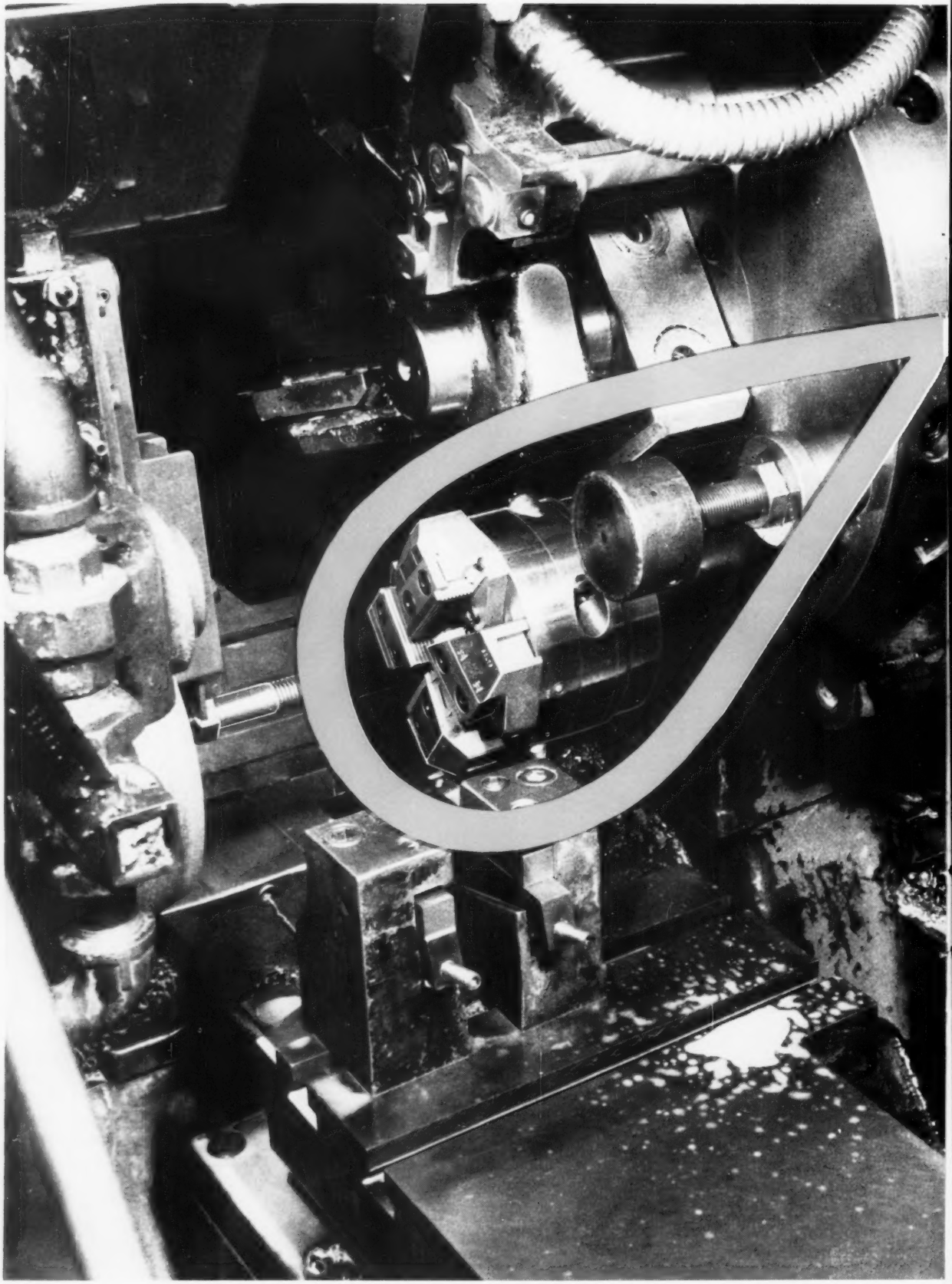

AUTOMATIC THREADING

to close tolerances on single-spindle automatic

Automatic opening and closing and *ability to meet exacting concentricity requirements* were the principal reasons a LANDIS Die Head was selected to thread drive wheel cap screws for industrial lift trucks manufactured at the Yale Materials Handling Division of The Yale and Towne Mfg. Co. in Philadelphia, Pa.

5/8", 11-pitch UNC threads are cut 7/8" long on 3140 steel by a LANDMATIC Head on a Cleveland Single-Spindle Screw Machine. Threads must meet Class 3 tolerances—in addition, the threads must be concentric with the screw body within .002".

A 1-1/4" FD LANDMATIC Head is being used for this work—a stationary, self-opening head arranged for automatic closing. A special over-travel feature eliminates the necessity of a complicated, accurately-set closing cam on the machine. Threads are produced to necessary tolerances at 18 SFM, with 400 pieces completed between chaser grinds.

This head, other than the over-travel feature, is a standard LANDMATIC Heat-Treated Head (primarily used for turret lathe threading) equipped with standard LANDIS Tangential Chasers. Even with this tough material, close tolerances are met with an excellent number of pieces between grinds. Further economies are realized as the chasers with regrinding will produce these threads for 80% of their original length. Wide range and oversize capacity are important features of the head—1/4" to 1-1/4" normal range, short thread lengths up to 2-3/4" in diameter with oversize chaser holders.

A wide variety of sizes and types of LANDIS Heads allow you to gain the utmost "threading efficiency". Send us your specifications and ask for Bulletins F-80 and F-90—let us suggest the LANDIS Head most suitable for your needs.

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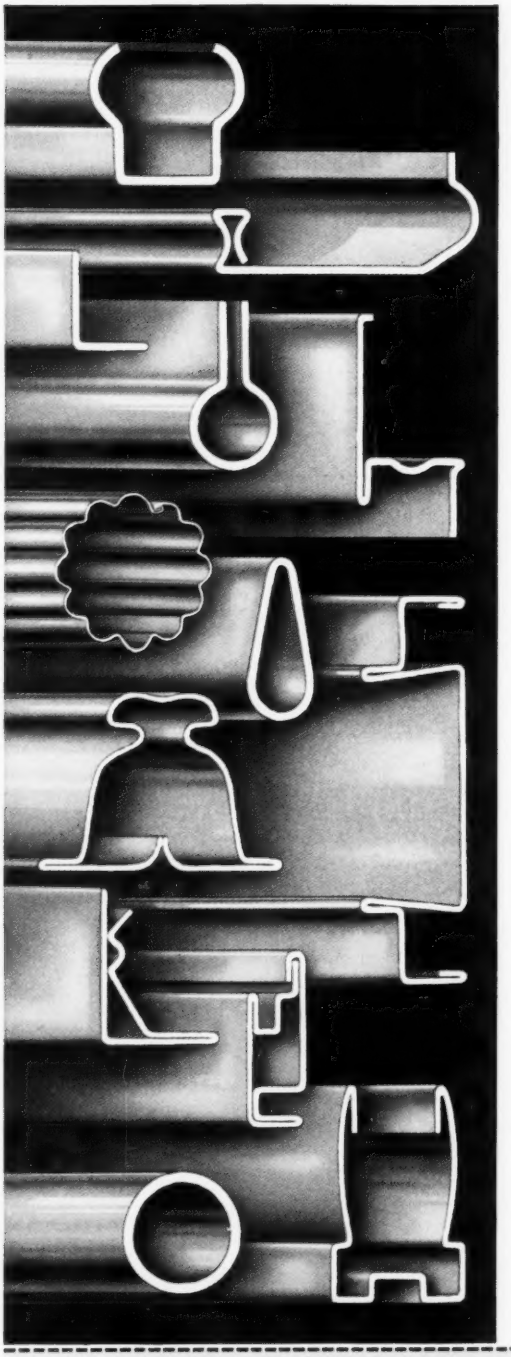

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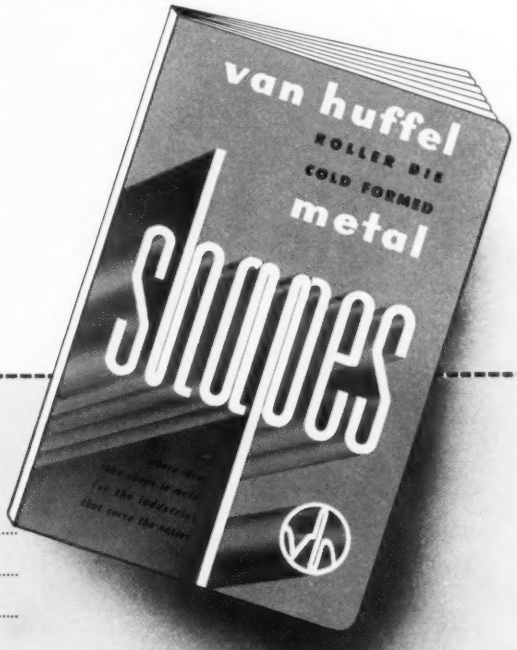

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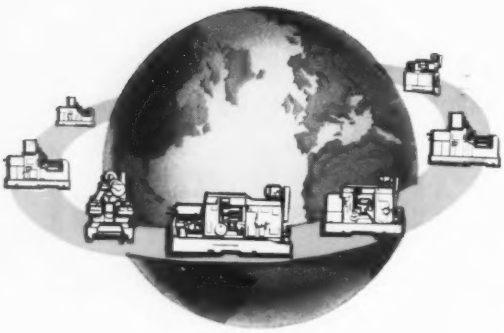
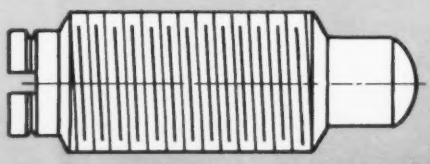
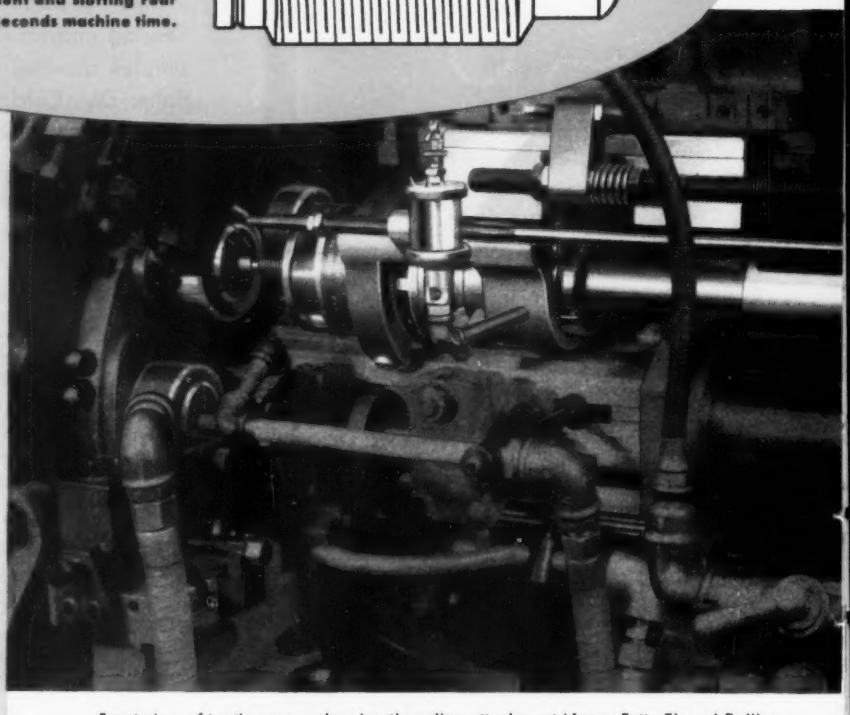


All 'round the world.

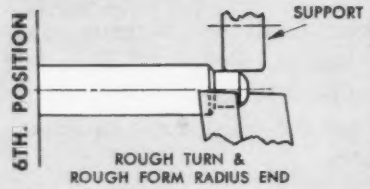
How Acme-Gridley BASIC DESIGN Saves Time in England

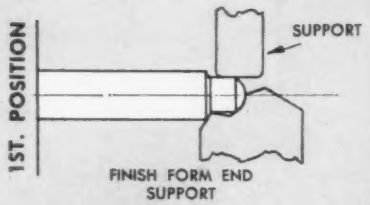
Tappet set screw, produced in England on a British-built 6-Spindle Acme-Gridley Bar Automatic. 10 operations—including thread rolling, induction hardening radius end, rotating pickoff attachment and slotting rear end—performed in 7 seconds machine time.

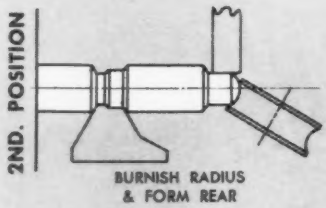


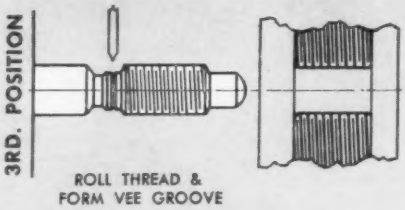


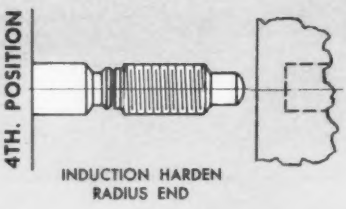
Front view of tooling zone, showing threading attachment (Acme-Fette Thread Rolling Head) in the third position, rolling 7/16—20 threads on end of work piece.

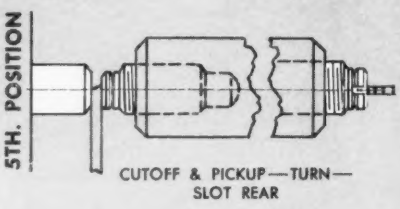












. . . where there's work to be done and time to be saved . . .

there's an Acme-Gridley to do it!

Regardless of whether they are "made in Britain", "made in Germany", or "made in the U. S. A.", Acme-Gridley Automatics all speak a universal language—*greater and more accurate production.*

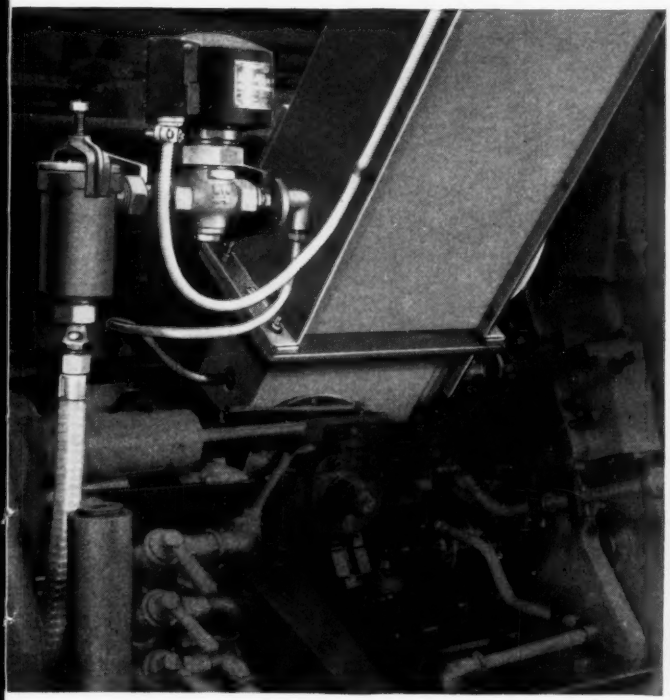
Wherever reduced production cost is the goal, the same basic ruggedness, the same wide-open tooling zone with the same distinctive tool-slide arrangement that encourages ingenious tooling on an Acme-Gridley in Detroit, challenges men's minds in Jaipur!

A recent example is this tappet screw, produced on an Acme-Gridley which was built by our licensee BSA Machine Tools Ltd., of Birmingham, England.

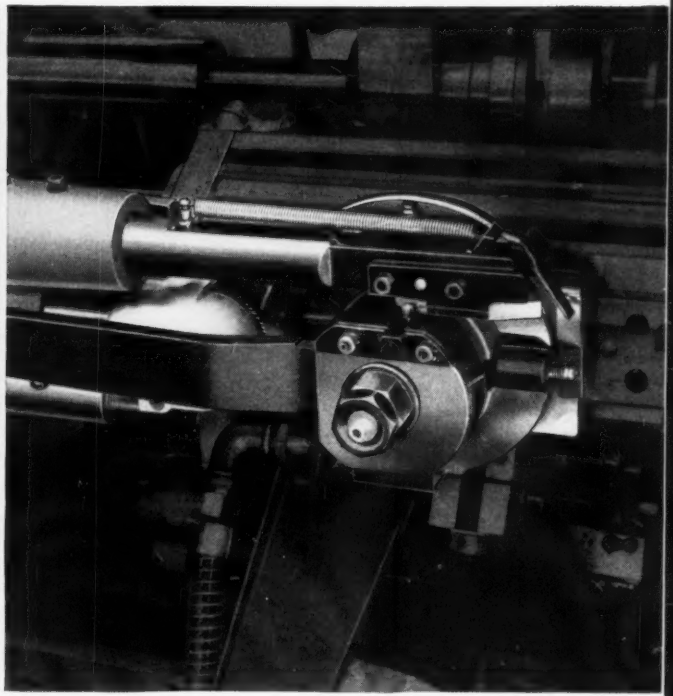
A unique combination of three operations normally considered "secondary", with seven others in the primary setup, eliminated costly extra handling and equipment. In addition to normal machining, the piece was induction hardened, threads were rolled on, and the piece was picked up, turned around and slotted—a total of 10 operations in 7 seconds.

* * *

This is typical of the way the Acme-Gridley principle of *circumferential automation* eliminates secondary handling—all over the world. It's what we mean when we say, "*where there's work to be done, and time to be saved, there's an Acme-Gridley to do it!*"



Detail of induction hardening device, showing quench oil reservoir and automatic metering valve for hardening radius end of tappet screw.



Detail of rotating pickoff attachment which picks off piece following cutoff in fifth position, rotates 180° so that piece can be slotted by saw (at left) in the sixth position.

why don't you

INDEX . . . to lower machining costs . . . with *Acme-Gridley* **CIRCUMFERENTIAL AUTOMATION**

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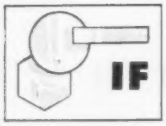

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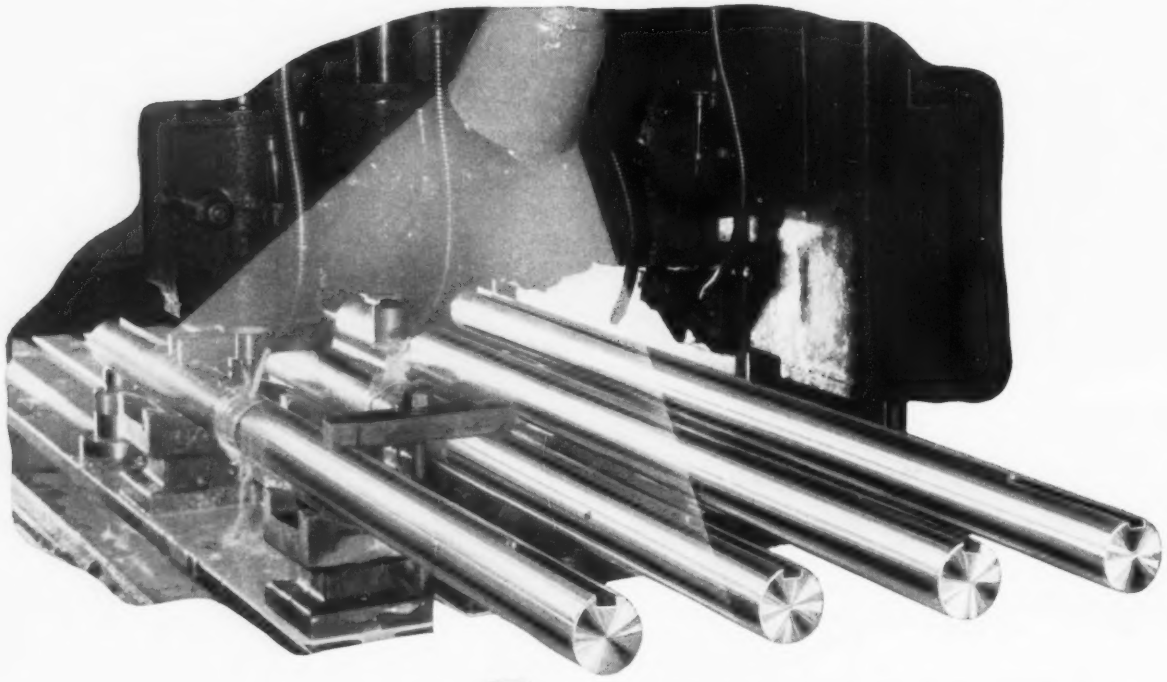

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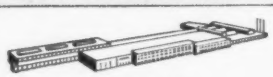
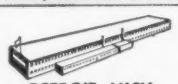
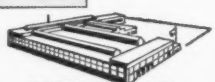


HARVEY, ILL.

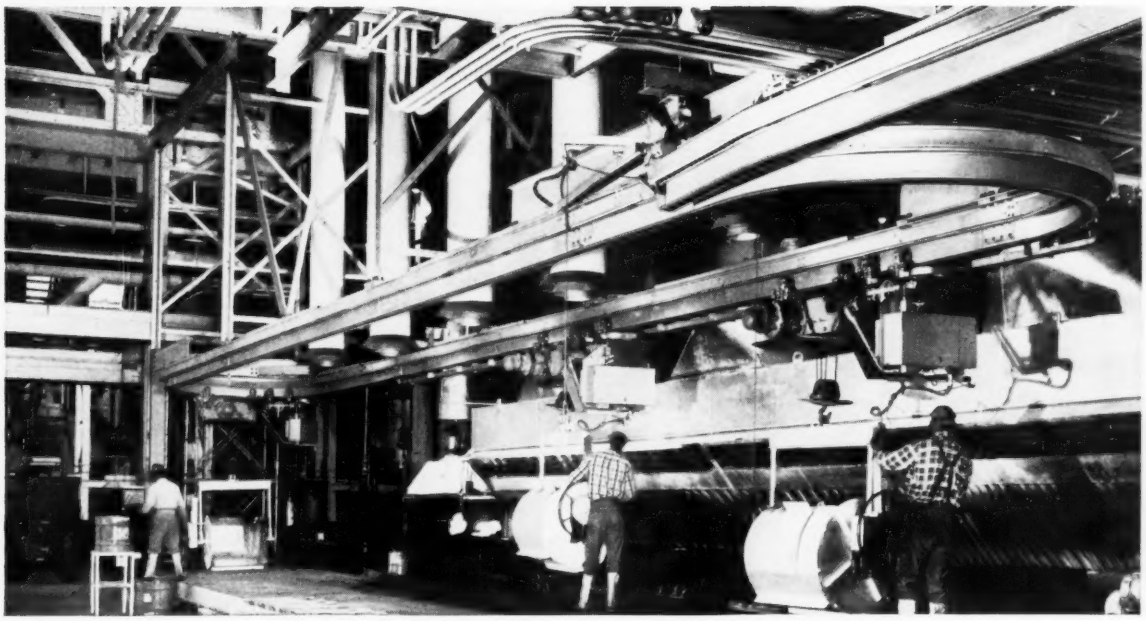


DETROIT, MICH.



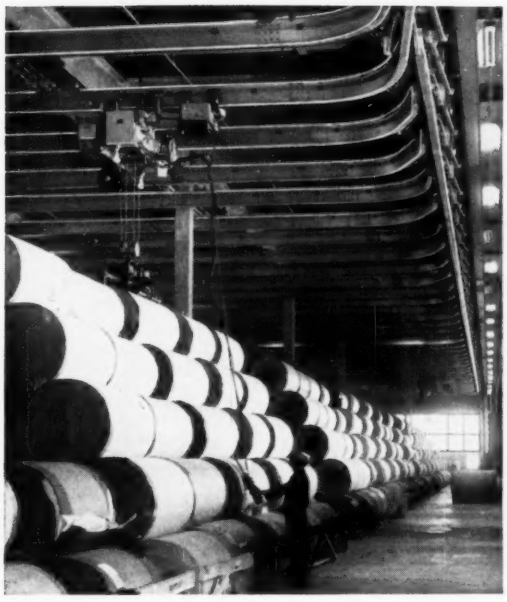
BUFFALO, N. Y.

MANSFIELD, MASS.



Here's a way to make your lost ceiling space pay off

AMERICAN MONORAIL



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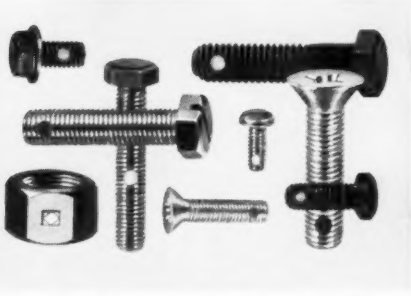
So don't just order fasteners, *select* Republic and be sure of the best. Contact your local Republic representative or distributor and choose the types and sizes you need from a variety of over 20,000 standards and 8,000 specials. Or, for illustrated literature, mail coupon.



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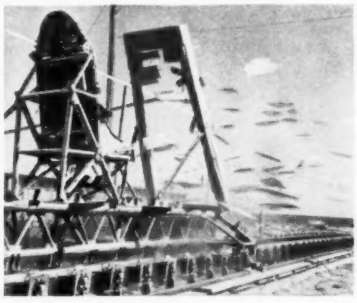

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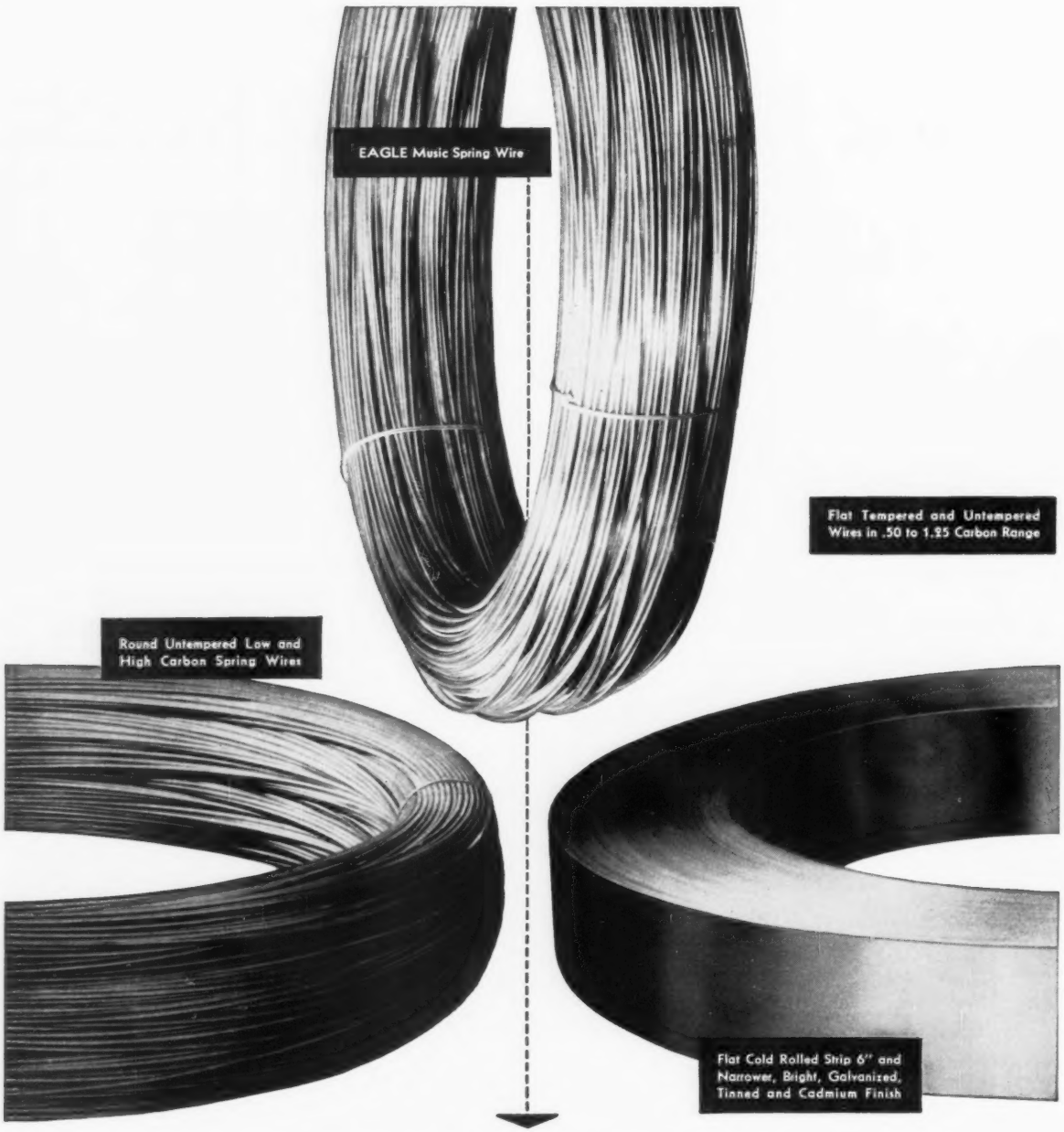
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Flat Tempered and Untempered Wires in .50 to 1.25 Carbon Range
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TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

CALENDAR
OF MEETINGS

Feb. 10-14, American Society for Testing Materials: Committee Week, Statler Hotel, St. Louis. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Feb. 11-13, Investment Casting Institute: Annual meeting, Roosevelt Hotel, New York. Institute's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: H. P. Dolan.

Feb. 14-15, National Association of Metal Finishers: Winter meeting, Dinkler-Plaza, Atlanta. Association's address: 60 Bentley Rd., Cedar Grove, N. J. Executive secretary: P. Peter Kovatis.

Feb. 15-19, American Institute of Mining, Metallurgical & Petroleum Engineers: Annual meeting, Statler and Sheraton-McAlpin Hotels, New York. Institute's address: 20 W. 39th St., New York 18, N. Y. Secretary: Ernest Kirkendall.

Feb. 17-19, American Management Association: Midwinter personnel conference, Palmer House, Chicago. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Feb. 18-20, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston Hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: H. P. Dolan.

Feb. 19-21, American Management Association: Special research and development conference, Biltmore Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Feb. 24-26, Association of Iron & Steel Engineers: Western meeting, Hotel Statler, Los Angeles. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Feb. 26-28, American Management Association: Special general management conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

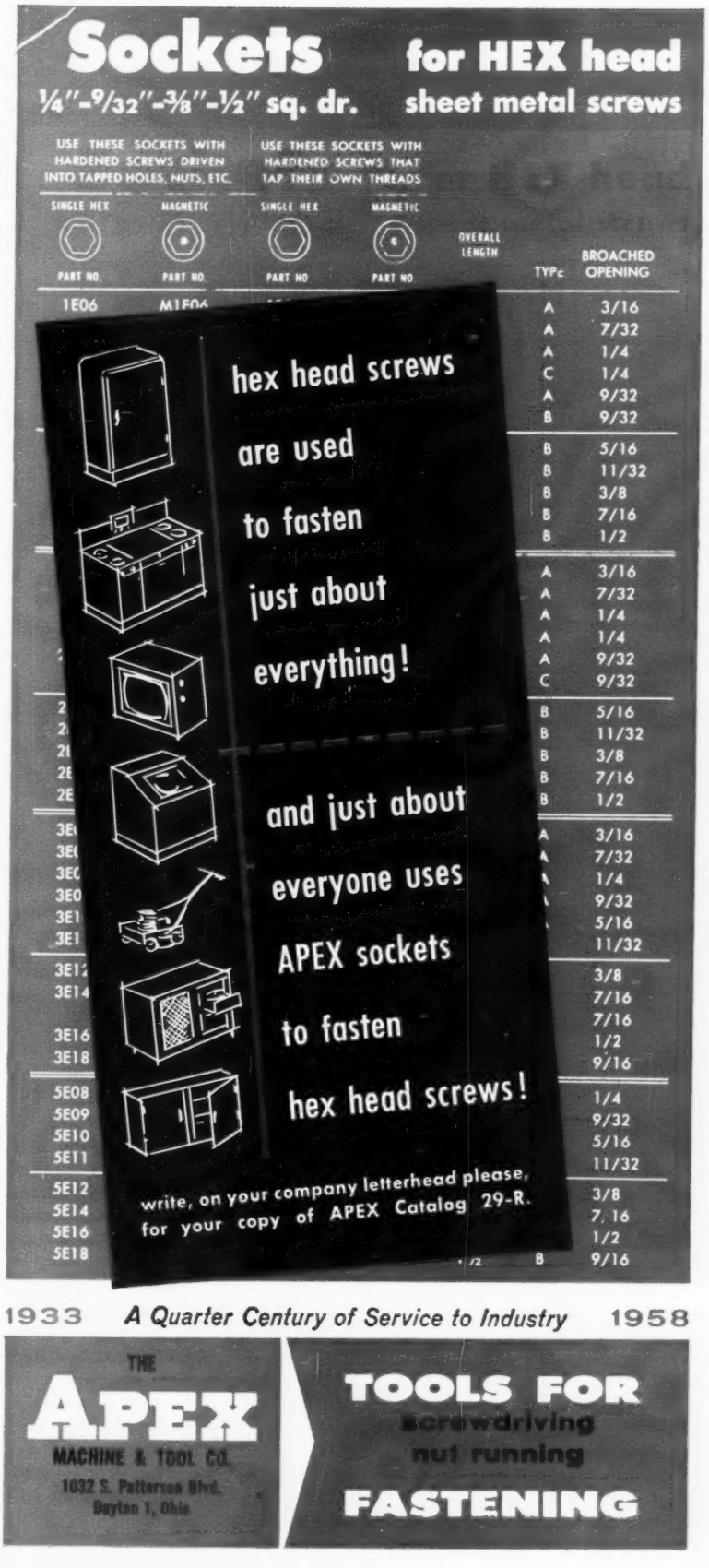
Feb. 28-Mar. 1, American Society for Quality Control: Middle Atlantic conference, Hotel Statler, New York. Conference chairman: F. W. Kroll Jr., Esso Standard Oil Co., Box 222, Linden, N. J.

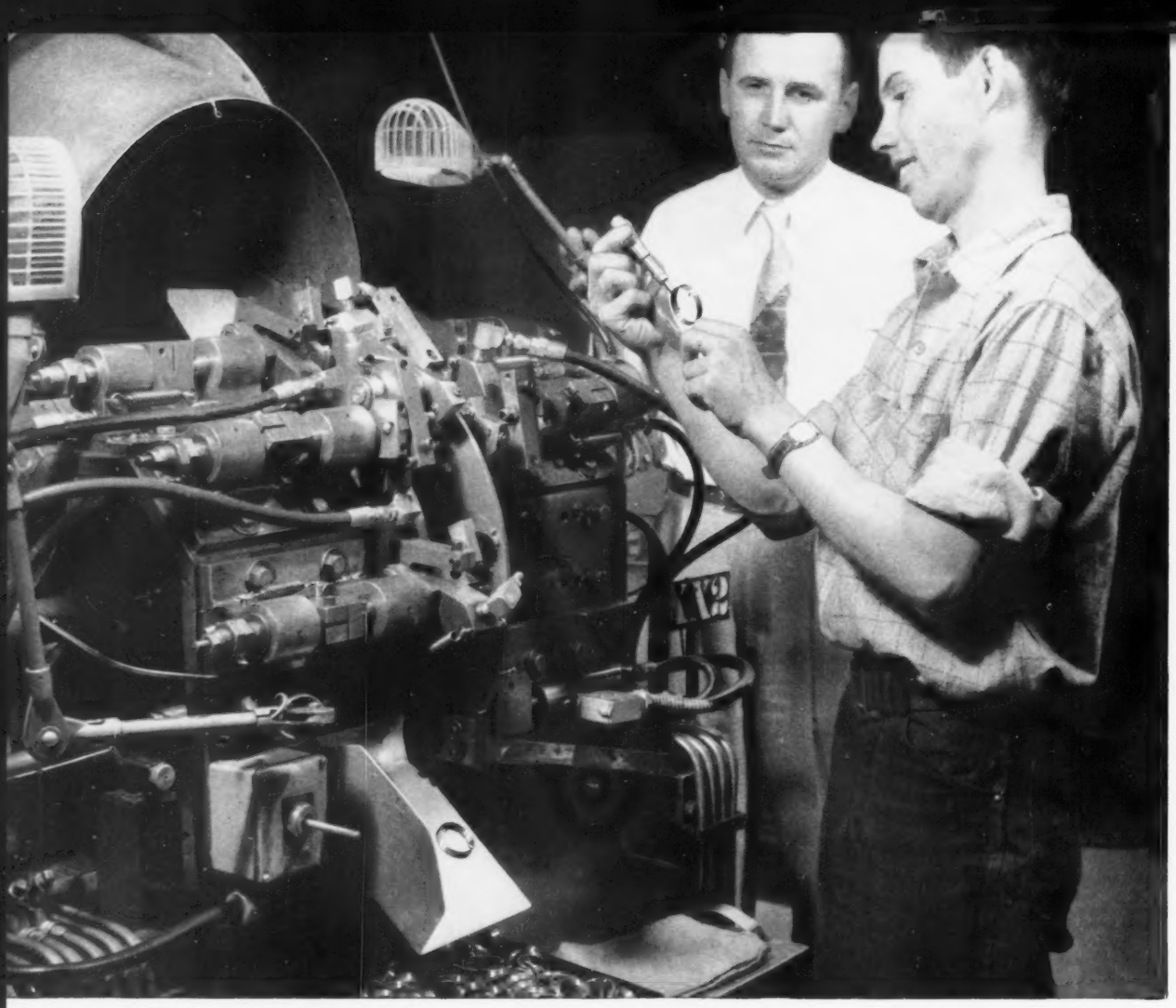
Mar. 2-6, American Society of Mechanical Engineers: Gas turbine power division conference and exhibit, Shoreham Hotel, Washington. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Mar. 3-5, American Management Association: Special finance conference, Statler Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Mar. 4-6, Society of Automotive Engineers: National passenger car, body, and materials meeting, Sheraton-Cadillac Hotel, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Mar. 9-11, American Machine Tool Distributors Association: Spring meeting, Roosevelt Hotel, New Orleans. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelley.





William Kody, American Coil Spring sales manager, watches as important product receives periodic check. An automobile window regulator clutch spring, it must be very precise. Johnson music spring wire fits product and machine.

Johnson Music Wire meets the test at American Coil Spring Company where . . .

Automation Demands Uniform High Quality

When American Coil Spring Company needed a precise music spring wire for an exacting auto window regulator spring, past experience prompted it to turn to Johnson Steel & Wire Company, a leading producer of high-carbon fine-specialty wires.

And when the same company—for 32 years one of the nation's top precision springmakers—was looking for ways to further automate its Muskegon, Mich., plant, Johnson came up with another answer—extra-sized coils of weld-free music wire to reduce machine downtime and wire handling.

One of the largest spring wire users in the United States, American Coil has a company watchword—Springs With a Pedigree. Everyone at American Coil lives up to this slogan by constantly emphasizing quality in every phase of production. This has paid off for American Coil by building a reputation for making the best of standard springs—and special springs others can't make.

Every bit of American Coil's skill comes into play on the auto window regulator spring. The spring has to have perfect diameter because it is mechanically inserted in the window clutch during an automatic assembly. Too large, and the spring won't fit. Too small, and it will cause slippage when the window is raised or lowered. Either variation in dimension will cause rejection.

To make the spring, which has three turns and is close wound with extended legs bent opposite, American Coil invented a special machine to combine the coiling and bending operations.

One-half of the challenge solved by the machine, American Coil then had to find a superior wire. Cast and peak had to be exactly as specified. Uniform dimension of .055″ X-L-O music wire had to be held, both within the coil and from coil to coil. Excellent surface was another must. Johnson's X-L-O music wire met these specifications readily. It is available in a full range of sizes between .003″ and .300″ and can be given a number of phosphate or other surface coatings.

Meeting this customer's requirements through ingenuity and good wire is a formula American Coil applied in the case of the extra-sized coils.

(Advertisement)

Springs are periodically projected onto the screen of this shadowgraph so that minute details of their conformation are compared with drawings.

Operator prepares for a run of springs for automatic bowling alley pin setters. The Johnson music spring wire that feeds this machine comes in a special 500 lb. bundle so that run will be twice as long. Downtime is reduced.

American Coil is committed to a policy of automating wherever possible. In springs requiring Johnson's .080″ and larger music wire, Johnson doubled coil sizes from the traditional 250 pounds to 500 pounds without welds. This reduced storage space, simplified handling and reduced downtime on the coiling machines. Moves like this permit American Coil to achieve a daily capacity of 18 million pieces with a labor force that numbers usually 350 people.

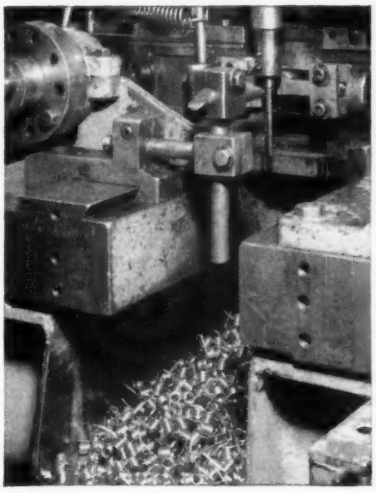
Of the relationship between American Coil and Johnson, Works Engineer James Church of American Coil says:

"The combination of our experience in springmaking and Johnson's superior knowledge of wiremaking, results in a highly successful product."

All these advantages of Johnson's wire are available to you, no matter whether you need music wire or any of the other specialties—

Aircraft Cord Wire . . Armature Binding Wire . . . Belt Hook Wire . . . Bobby Pin Wire . . . Brush Wire . . . Gutterbroom Wire . . . Card Wire . . . Shade Roller Wire . . . Flexible Shaft Wire . . . Heddle Wire . . . Hose Reinforcement Wire . . . Hose Wire . . . Mandolin Wire . . . Piano Wire . . . Rope Wire . . . Safety Pin Wire . . . Special Shaped Wire . . . Staple Wire . . . Metal Stitching Wire . . . Signal Corps Wire . . . MB Spring Wire . . . Tire Bead Wire.

If you have an application which requires high quality and close tolerances, Johnson is ready to serve you. Call your closest district office today.



Nobody watches this machine as it produces thousands of perfectly duplicated springs. If the wire were not highly accurate in dimension and metallurgical characteristics, frequent adjustments would be necessary.

Testing for tension is a constant operation at American Coil Spring. Variations in wire quality would show up here. American is well satisfied with Johnson music wire quality.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

***a subsidiary of* Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

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Fastener Facts

by Henry Peterson, Chief Engineer — Judson L. Thomson Mfg. Co.

DESIGN PRODUCTION & PURCHASING DATA

USE OF BIFURCATED (SPLIT) RIVETS

Self-Piercing Fasteners

You specify bifurcated (split) rivets when you want self-piercing, permanent fasteners for high-speed assembly of light metals (up to 0.040" thick), wood, fibre, leather, canvas and plastics.

Slots milled in the bodies of cold-headed solid rivets form two prongs that have the inherent strength of forgings.

Advantages of Use:

With bifurcated rivets, you not only eliminate the delay and cost of pre-punching or pre-drilling holes, but also avoid weakening assemblies through removal of material. Applied by high-speed automatic rivet-setting machines, which can be operated by unskilled help, they reduce assembly time and costs to a minimum.

When you specify Thomson Bifurcated Rivets, you make sure of the fastest possible solution to your fastening problem and earliest possible delivery of test samples and production quantities.

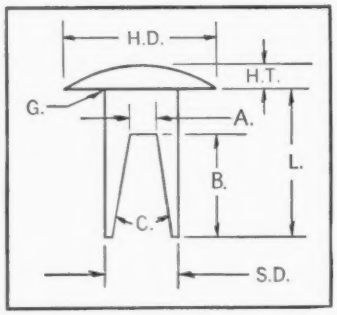
As the first patent holder on bifurcated rivets, Thomson has the longest experience in applying them. Since 1885, thousands of standards have been developed for manufacturers of canvas bags, dog collars and harnesses, golf bags and shoes, hand bags, leather goods, luggage, raincoats, sheet metal products and assemblies, sporting goods, tote boxes, and other products. So your chances of solving special problems with standard bifurcated rivets are best when you call on Thomson.

DIMENSIONAL DATA:

Head Diameter (H.D.) ranges between 1.75 and 2.75 times shank diameter for rivets produced by single-die heading machines. Larger diameters are available at higher cost.

Head Thickness (H.T.) ranges from 0.3 to 0.6 times shank diameter depending on head shape: oval, flat countersunk, ideal, flat, countersunk with bevel on bottom.

Shank Diameter (S.D.) ranges from .040" to .330" for standard sizes.

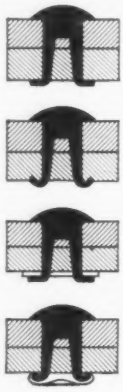


Slot Width (A.), Slot Depth (B.) and **Slot Angle (C.)** vary with each application, depending on thickness and hardness of materials and strength requirements of the clinch. Tests on actual samples are recommended in most cases.

Rivet Length (L.) ranges from 0.6 to 6 times shank diameter. Exact length is generally determined by adding shank diameter to assembly thickness.

Radius (G.) at corners ranges from .005" for ¼" rivets to .015" for 2" rivets.

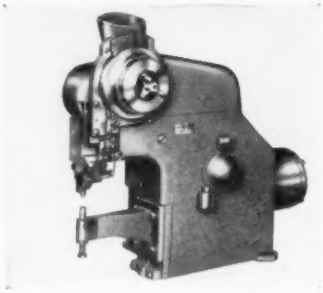
Four Types of Clinch:



Thomson Bifurcated Rivets are clinched by anvils that spread the prongs flush with the surface, turn their prongs into material, against burrs (washers) or inside caps. The latter two methods are specified when a stronger bearing surface is required. The use of caps improves assembly appearance by giving uniform appearance to both ends of the rivets. Washers and caps are applied by multiple-feed automatic rivet-setting machines. The use of caps, calls for perfectly symmetrical rivets so that neither prong will miss the cap. Thomson guards against such misses by precision manufacturing, statistical quality control, 100% final inspection and factory tests on actual samples.

High-Speed Rivet-Setting Machines

Whatever your fastening job, the chances are that one of Thomson's more than 200 standard rivet-setting machines can be quickly and easily adapted to fit your needs. Models include combination rivet and cap-setting in both bench- and floor-types with 5" throat depth. Automatic hopper feed, multiple rivet-setting heads and special work-handling and loading devices are accessories that speed up assembly. Thomson helps you select the proper machine for your job, custom-tools it to meet your requirements and factory-tests it on actual samples before shipment. Available on a sale or lease basis.



MOTOR-OPERATED BENCH MACHINE

Design and Engineering Service

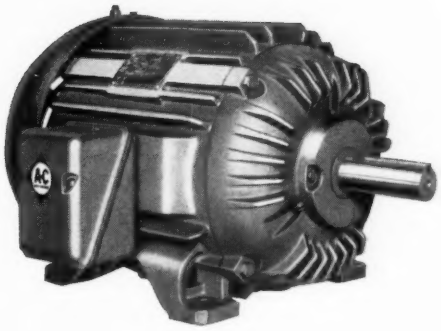
Save time and money by asking Thomson Engineers to study your fastening problems before your designs are frozen. This service, performed at your request, promises the speediest delivery of the right rivets and machines for you. Send sketches, prints, or actual samples for recommendations and quotations.

Free "Fastener Fact File".

This new Thomson manual is compulsory reading for anybody who specifies or buys fasteners. It covers everything you need to know to take advantage of the economy and speed of rivets and rivet-setting machines: rivet types, applications, material finishes and other vital factors.

Request your copy today. Write Judson L. Thomson Mfg. Co., Dept. S, Waltham 54, Massachusetts.

JTL JUDSON L. THOMSON MFG. CO., WALTHAM 54, MASS.



long-run power by Allis-Chalmers

If you specify "Allis-Chalmers motors or equal"

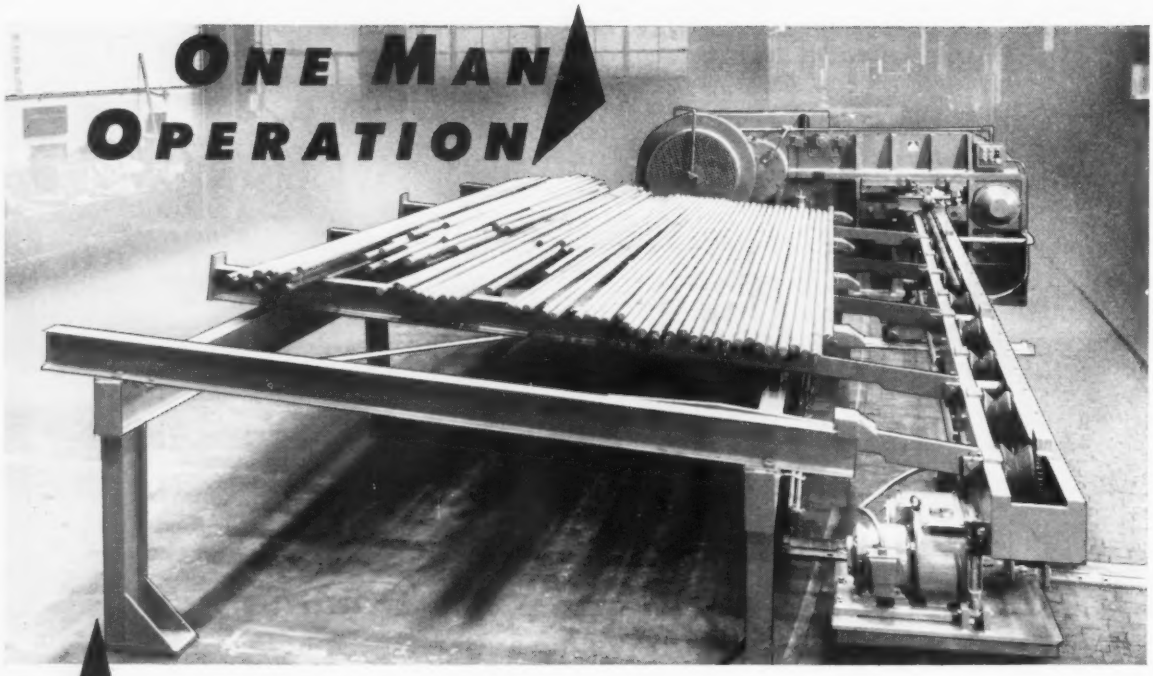
. . . remember that the "equal" is possible only in two respects: price and nameplate specifications. You can't match the *long-run power* of Allis-Chalmers motors.

Double-shielded bearings guarded against dirt and over-greasing . . . provision for elimination of moisture condensation . . . practically indestructible rotor design . . . more cooling surface . . . more iron and copper content — these are the features (with others) that make up long-run power. These are the features that give Allis-Chalmers motors "plus" performance that can't be equalled.

Find out more about the motors with long-run power from your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5663

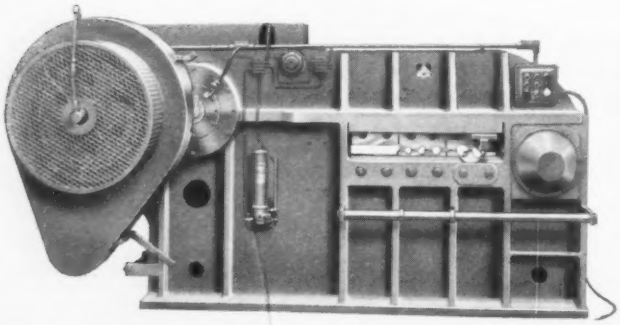


Production cutting of bar stock on a **HILL ACME** *Bar-Billet Shear with auxiliary automatic feed*

The nearest thing to automation achieved so far in the production cutting of bar stock is the HILL ACME BAR-BILLET shear with auxiliary automatic feed. With one man as standby observer, bars are fed automatically from the rack to the roll feed mechanism. Automatic stops on the billet shear predetermine the length of cut.

On ideal installations bars travel from steel storage on conveyors through the billet shear to tote boxes without being touched by hand.

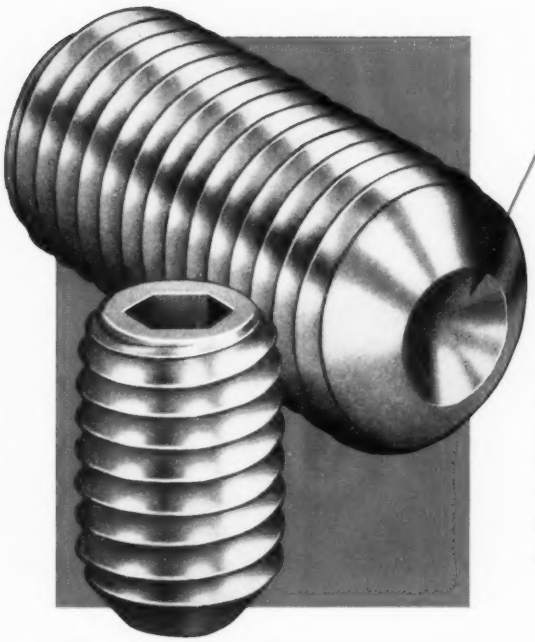
HILL ACME BAR-BILLET shears have proven to be the most efficient, economical and trouble-free units on the market today. With the exclusive outboard support on the drop-off side, square, accurate cuts are assured. These high production shears are built in a variety of sizes to meet every cutting need up to 9″ in rounds. A new bulletin covering all details of construction and operation is now available.



The HILL ACME Company

MANUFACTURERS OF:
"CANTON" ROTARY SCRAP SHEARS • ALLIGATOR SHEARS • BILLET SHEARS • "HILL" GRINDING AND POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • "ACME" FORGING • THREADING • TAPPING MACHINES • "CLEVELAND" KNIVES & SHEAR BLADES

1201 West 65th St., Cleveland 2, Ohio



ALLENPOINT will give you a bulldog grip at no premium in price!

Allen's scientific redesign of the cup diameter on set screws gives greatly increased resistance to *withdrawal* torque. You can count on Allenpoint Set Screws to stay tighter longer, under heavy strain and vibrations. This dependable premium performance of Allenpoints is yours to use without increasing the cost of manufacturing your products.

Uniform Class 3A Threads

Allenpoints' smooth, uniform threads prevent off-lead conditions like Fig. 1. With Allenpoints, you have full, even contact between the engaging flanks of the threaded members (Fig. 2) —and a tight friction lock over the entire length of the Allenpoint Set Screw.

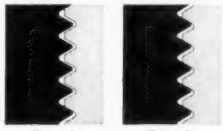
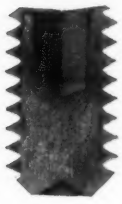


Fig. 1 Fig. 2

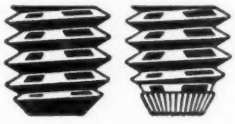
Strong, clean, deep sockets allow full wrenching leverage



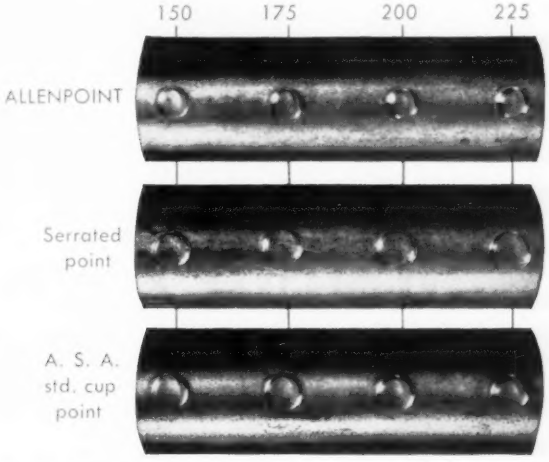
Sockets of Allenpoint Set Screws are cold forged to produce a deeper, smoother socket. No broach chips to interfere with proper seating of the key. This "pressur-forming" preserves the long steel fibers throughout the length of the screw—stronger walls allow maximum tightening torque.

One more full thread on ALLENPOINTS!

Allenpoint Set Screws have one more full thread than serrated point set screws. That means more holding power—especially important when you're using short lengths.



ALLENPOINT's performance compared for you



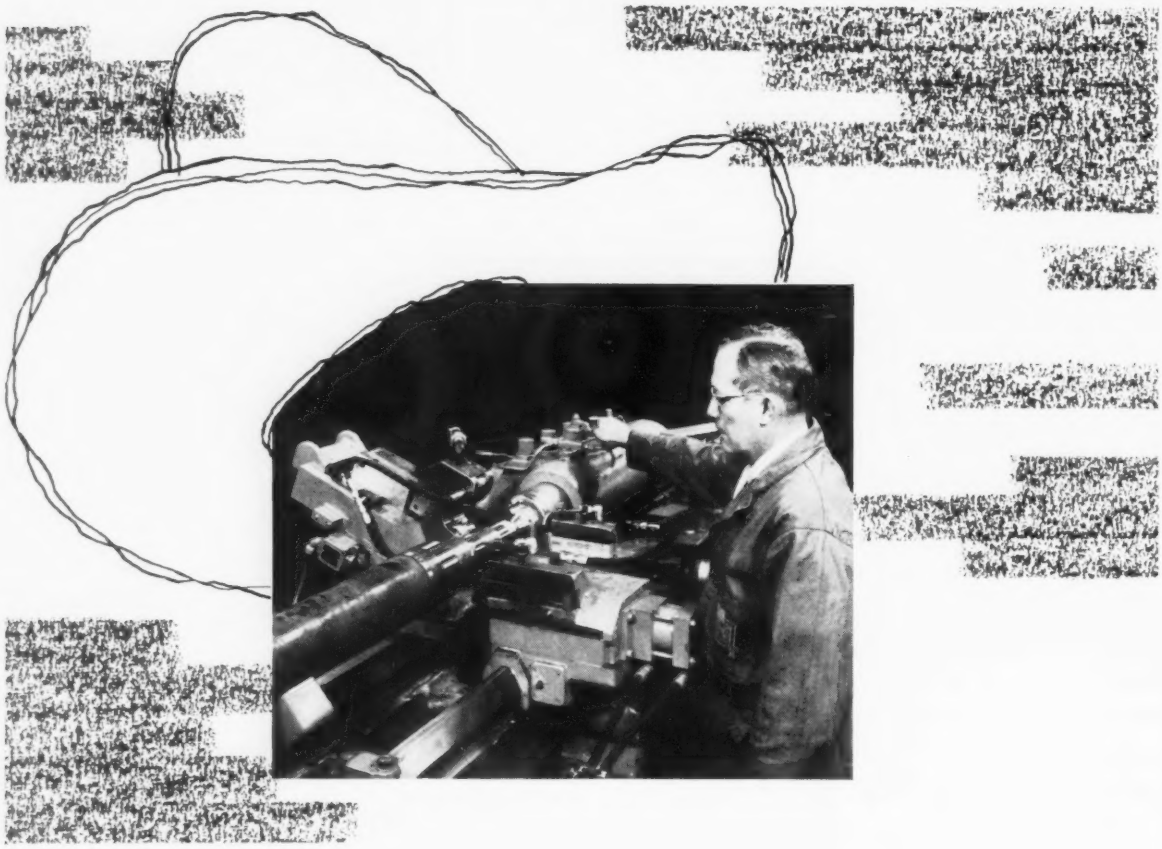
These actual-size, unretouched photographs show the cup pattern made by Allenpoints, serrated points, and A.S.A. standard cup point set screws in a 3/4" steel shaft. At each degree of tightening force, Allenpoints make a full circle pattern, penetrating deeper for greater holding power.

We'll be glad to send you more information and samples of Allenpoint Set Screws and other Allen Socket Screw products.

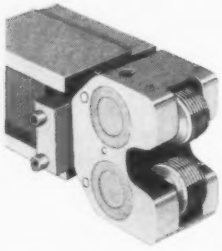
Stocked and sold by leading industrial distributors everywhere

ALLEN MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

ALLEN HEX-SOCKET SCREWS HEAD



Roll your own *in no time* with a Monarch Mona-Matic!



ON THIS JOB, thread rollers mounted on the hydraulically-operated rear slide perform a very precise thread rolling job *during traverse return* of the front carriage. If that's not strictly "no time," it's certainly "no-cost time"—and who could possibly want more than that?

The part is a fabricated trailer axle, about 80″ long, identical spindle ends of which are turned and threaded. There are three turned sections on each end with the end diameter threaded at the tag end of the cycle.

Because the axle is fabricated by butt welding the forged, rough turned spindle ends to a piece of seamless steel tubing, an interesting front carriage cycle is employed. During one of the three feed movements, the welding bead is removed by a tool on a hydraulically operated auxiliary slide mounted on the left hand end of the carriage.

And that's only part of the Mona-Matic savings story! Customer used to turn on one machine, thread on another with a die head. Now he does the *whole job—on one machine—faster than just the turning used to take.*

Remember that thread rolling (up to 1½″ diameter) is an extra for some users—only one of many that can be yours when you turn the Mona-Matic way. Let us figure a job for you...**The Monarch Machine Tool Company, Sidney, Ohio.**

Monarch
TURNING MACHINES
ACCURACY • ECONOMY • LONG LIFE
FOR A GOOD TURN FASTER . . . TURN TO MONARCH

Buying stainless steel plate from Jessop is like owning your own mill

When you order from Jessop you don't wait in line. Jessop operates a compact, highly adaptable stainless plate department—all under one roof from melting to finishing. Production schedules can be adjusted overnight to suit your need. Moreover, with the 3rd largest stainless plate mill in the country now in operation, sizes are available up to 80″ in width and 240″ in length. And Jessop's years-ahead chemical control equipment quickly identifies tramp elements in the molten bath—permits their removal so you will enjoy improved forming and welding characteristics in the finished plate. You'll find it will pay to send your next inquiry to Jessop where doing business is like owning your own mill.

CONSOLID… CO.

To: JESSOP STEEL COMPANY

Quantity Description

Rush!

JESSOP

DELIVERED

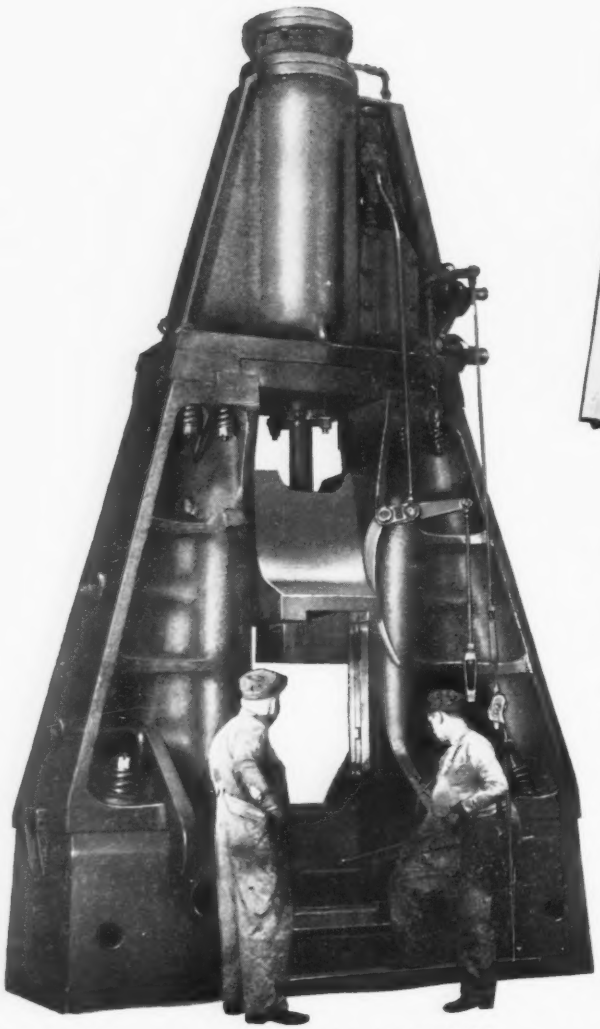
STEEL COMPANY · WASHINGTON, PA.

OFFICES IN PRINCIPAL CITIES

Wholly-owned Subsidiaries: Jessop Steel of Canada Limited, Wallaceburg, Toronto
Jessop Steel International Corp., Chrysler Building, New York, New York
Green River Steel Corporation, Owensboro, Kentucky

Do your Steam Hammers look like this?

TIME TO **MODERNIZE**



CHAMBERSBURG
STEAM DROP HAMMERS

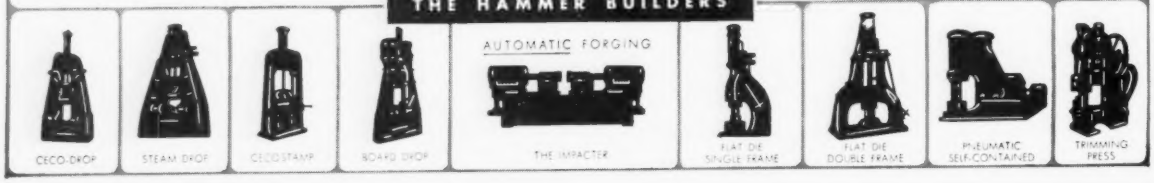
have kept pace with modern forge shop requirements. With Chambersburg Steam Drop Hammers you get more forging per blow and more forgings per hour for higher production. And—at the same time you'll find production savings in lower power consumption, less downtime, better die alignment. Every feature of Chambersburg Hammers is designed to produce forgings at the lowest possible cost per piece.

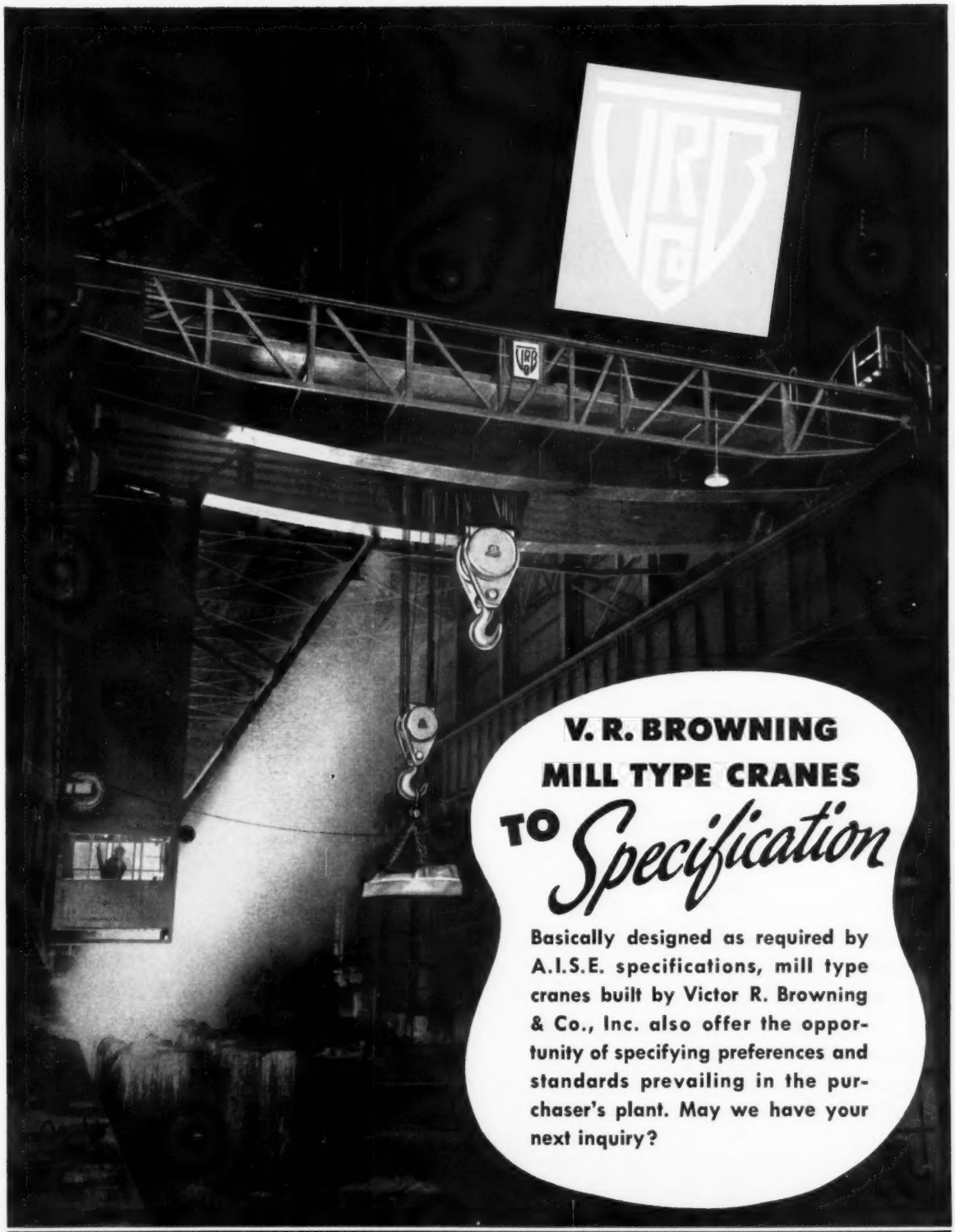
Write for Bulletin

CHAMBERSBURG ENGINEERING COMPANY . . . . . CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS





V. R. BROWNING
MILL TYPE CRANES
TO *Specification*

Basically designed as required by A.I.S.E. specifications, mill type cranes built by Victor R. Browning & Co., Inc. also offer the opportunity of specifying preferences and standards prevailing in the purchaser's plant. May we have your next inquiry?

VICTOR R. BROWNING & COMPANY, Inc.
BOX 309, WILLOUGHBY (CLEVELAND), OHIO
Designers and Builders of Electric Overhead Traveling Cranes and Hoists and Electric Revolving Cranes

FORGED INSET

Flash Butt-Welded Into a Stainless Ring

SAVES MATERIAL, TIME, and MONEY

By welding a forging into a circled section of an extruded shape, American Welding saved one jet engine manufacturer over 200 lbs. of AMS-5613 stainless steel per ring. Hours of machining time were also eliminated. The finished ring met both government and prime contractor's specifications. Savings per ring were very substantial.

This is a typical example of how American Welding's experience in forming and welding of stainless, aluminum, titanium and heat-resistant alloys has helped others cut production costs — and may be able to help you.

If your problem is circular and of metal — call American Welding first.

NEW PRODUCTS CATALOG AVAILABLE

Write today for 20-page catalog illustrating the many types of circular products American Welding can form, weld and machine for you.

AMERICAN WELDING

THE AMERICAN WELDING & MANUFACTURING CO.

110 DIETZ ROAD • WARREN, OHIO

Titanium Producers Meet with ODM

Officials of some of the titanium companies and the Office of Defense Mobilization held a hush-hush meeting. Subject: Problems of an industry operating at only 40 to 50 per cent of capacity. Also discussed: Termination of government contracts and the return of plants to the government. The whole titanium industry was built at government insistence, using federal help in the form of procurement contracts, research contracts, and federal advances. While industry spokesmen express long term confidence in titanium's future, they're having troubles now.

U. S. Role in Titanium

Titanium contracts with the U. S. include these details: Titanium Metals Corp. of America can terminate if it demonstrates its failure to earn a reasonable profit. It can hand over facilities to the government in full settlement of what's left on its loans. But it has already paid off a good deal on its U. S. debt. Cramet Inc. (owned by Republic Steel Corp. and Crane Co.) can terminate if there's an operating loss, transfer the plant to the government, and collect up to $6.26 million for "materials and other incurred costs." Electro Metallurgical Co., a division of Union Carbide Corp., is no longer selling titanium to the government. If Electro Met stops operating the facilities, it will cost the U. S. $20 million for the "unrecovered portion of the plant cost." The plant wouldn't revert to government ownership as in the other two cases. Two more U. S. sponsored contracts, those with Dow Chemical Co. and E. I. du Pont de Nemours & Co., have no reversion-to-the-government features.

Steel's Capital Outlays in '58: $1 Billion

Iron and steel companies plan to spend about $1 billion in 1958 for capital improvements. American Iron & Steel Institute reports they spent $1.75 billion last year, highest in their history. The 1957 expenditure brought the total capital investment by the industry since World War II to more than $9.9 billion.

Plasticsmakers See 20 Per Cent Gain

Most makers of reinforced plastics expect a 20 per cent sales increase in 1958 over 1957. Volume of $168 million last year was up one-fifth over 1956. Aircraft and missiles take 15 per cent of plastics output; appliances 3 per cent, boats 15 per cent, construction 15 per cent, consumer products 15 per cent, containers and trays 3 per cent, electrical 3 per cent, pipe and tanks 2 per cent, transportation 20 per cent, miscellaneous 9 per cent.

Missiles and Small Business

Sen. Edward Thye (R., Minn.), ranking minority member of the Senate Small Business Committee, is determined to see small companies get a better share of research and development contracts and component subcontracts for the missile program. He hopes to set up a special missile subcommittee

to keep tabs on the situation. The committee reports 6336 defense contracts with a value of $1.3 billion did not go to small firms in the last half of 1957 because: 1. Almost 350 of them lacked adequate drawings and specifications. 2. About 1750 required the contracting officer to award them to specific firms. 3. About 4000 were contracts with proprietary rights. 4. About 250 were "single sole source" actions.

Mr. Reuther Gets a Soap Box

Sen. Estes Kefauver's (D., Tenn.) Antitrust & Monopoly Subcommittee hearings are degenerating into a pro-Reuther prologue to wage negotiations this spring. That's the opinion of many in Washington who heard General Motors Corp.'s Harlow Curtice and the UAW's Walter Reuther when they appeared before the group. The questioning of Mr. Curtice was perfunctory, that of the UAW president elaborate.

Profit Sharing or Profit Squeezing?

The UAW campaign for profit sharing is actually profit squeezing, and the principal victims would be its intended beneficiaries—the workers. So charges Roger M. Blough, U. S. Steel Corp. chairman. He labels as fallacious the union dogma that purchasing power is increased through wage hikes alone. He believes that the UAW ignores these facts: The present slump began when purchasing power was highest in history. Since 1950, corporate profits have shrunk by one-third.

Salesmen Travel Farther

Metal products industry salesmen are traveling 20 per cent farther trying to equal their 1957 sales volume. They averaged 2419 miles a month in December, compared with 2006 in June, 1957, says Emkay Inc., auto fleet leasing firm.

A Russian Dawn

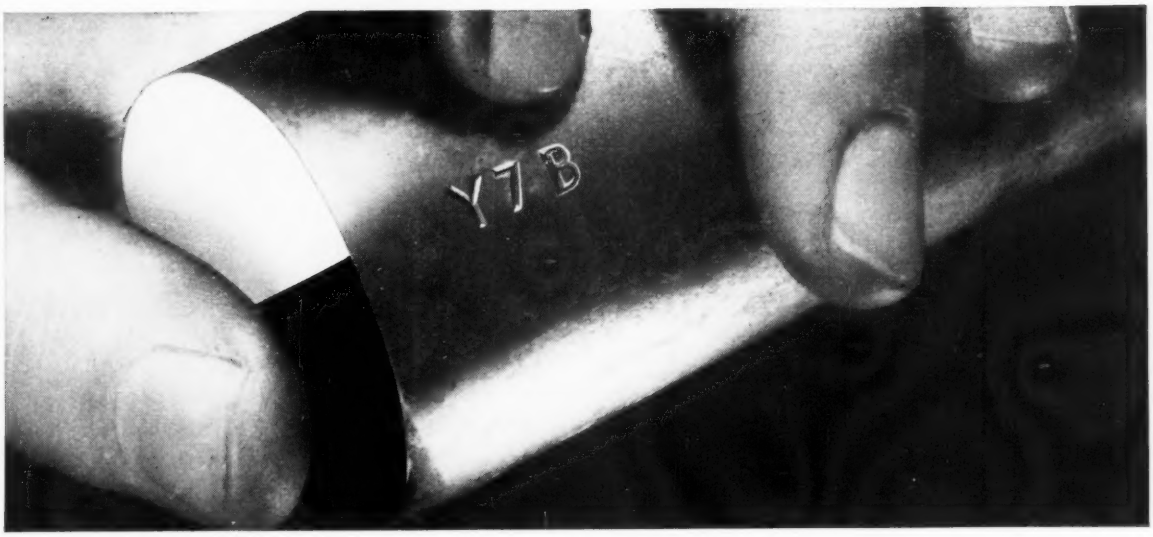
If you get up at 6:30 a.m. and live in the Schenectady, N. Y., area, you can learn Russian via television. Last week, General Electric Co.'s WRGB-TV started a dawn course, which it will present twice a week for 12 weeks. It's designed to help speed dissemination of Russian technical literature to U. S. scientists and engineers.

Straws in the Wind

St. Joseph Lead Co. and Bethlehem Steel Co. will spend $30 million to $35 million to develop an iron ore deposit in the Missouri Ozarks with an estimated ore reserve of 50 million to 100 million tons . . . In a case involving the United Mine Workers, the Supreme Court has ruled that a union need not comply with the Taft-Hartley Act to legally represent workers, but if it doesn't comply it has no right to advantages enjoyed by complying unions, chiefly the right to file unfair labor practice charges with the National Labor Relations Board . . . The merger of Ex-Cell-O Corp. and Bryant Chucking Grinder Co. has been consummated.

As positive as a fingerprint–

certified alloys from Ryerson



Alloys from different furnace heats can vary in hardenability and other working characteristics. But with Ryerson alloys you *know* the differences—before you start production. Ryerson alloys are marked with symbols identifying them with the particular heat from which they were rolled. As a Ryerson *extra* you get a dependable special report showing:

1. **Heat analysis.** Not just the chemical range for the type of alloy, but the specific analysis of the heat from which your steel was rolled.
2. **Tested Hardenability.** Not just the average hardenability for the alloy, but the actual Ryerson-tested hardenability for the particular heat . . . as quenched, and at three draw temperatures.

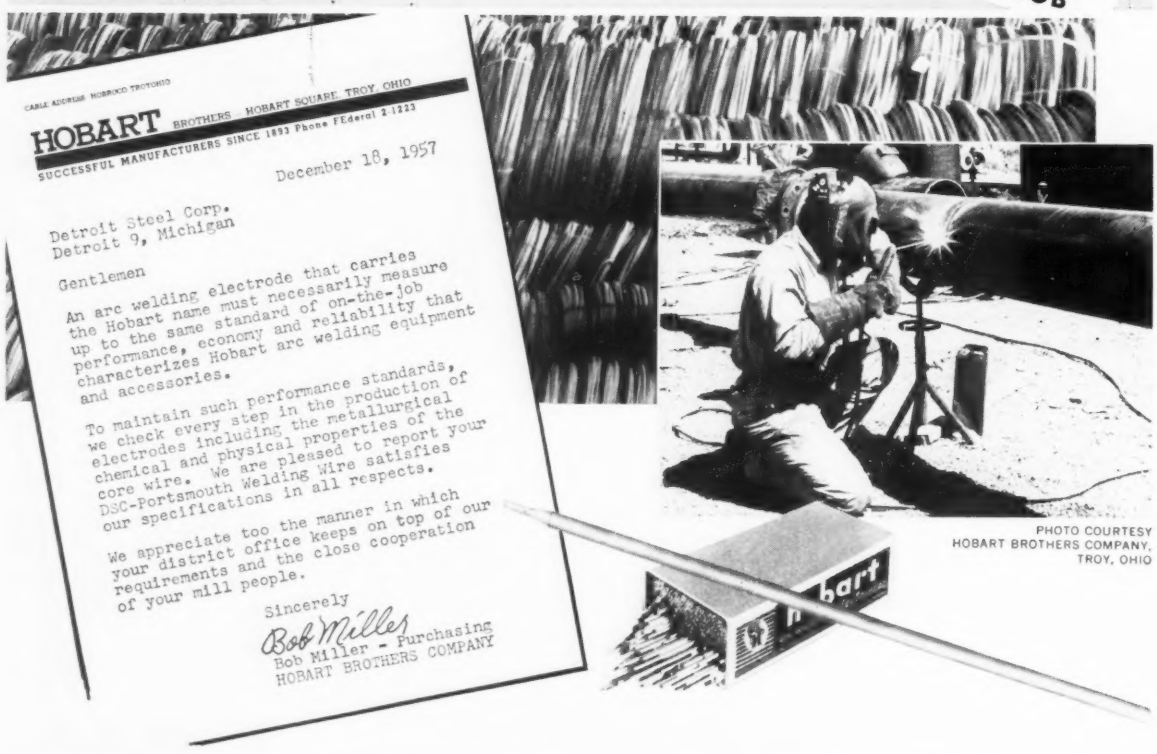
For more information about Ryerson alloys and the Ryerson Certified Alloy Steel plan, call your nearby Ryerson plant.

Principal products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing, industrial plastics, machinery and tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The PROOF of DSC STEEL is in its PERFORMANCE ON YOUR JOB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HOBART BROTHERS HOBART SQUARE, TROY, OHIO
SUCCESSFUL MANUFACTURERS SINCE 1893 Phone FEderal 2-1223
December 18, 1957
Detroit Steel Corp.
Detroit 9, Michigan
Gentlemen
An arc welding electrode that carries the Hobart name must necessarily measure up to the same standard of on-the-job performance, economy and reliability that characterizes Hobart arc welding equipment and accessories.
To maintain such performance standards, we check every step in the production of electrodes including the metallurgical chemical and physical properties of the core wire. We are pleased to report your DSC-Portsmouth Welding Wire satisfies our specifications in all respects.
We appreciate too the manner in which your district office keeps on top of our requirements and the close cooperation of your mill people.
Sincerely
Bob Miller
Bob Miller - Purchasing
HOBART BROTHERS COMPANY
Hobart

PHOTO COURTESY
HOBART BROTHERS COMPANY,
TROY, OHIO

DSC Portsmouth Welding Wire Helps Maintain Hobart Electrode Quality

"HOBART" IS THE WORD FOR WELDING

Established in 1893, Hobart Brothers Company, Troy, Ohio, is known as "One of the World's Largest Builders of Arc Welders and Arc Welding Equipment."

They have exerted a powerful influence on the advancement of the welding art itself and on the engineering perfection of welders and related equipment. They even operate a full-scale trade school of their own. Many welding operators attribute their skill to Hobart training.

The Hobart people maintain the strictest kind of quality control over every phase of production, including the manufacture of electrodes. That places a matching responsibility on the producer of the electrode core wire.

"SPECIAL" IS THE WORD FOR WELDING WIRE

Portsmouth Welding Wire for electrode cores is a good example of DSC steelmanship.

The product starts with selected low carbon ingots which conform to the restricted chemistry requirements. Blooms are specially cropped; billets, selectively discarded to insure the required physical and chemical uniformity.

After special preparation the rods are drawn into the welding wire. Special lubricants are used here. The welding wire, which emerges dry and bright in finish, must be suitably protected against physical damage and rusting in handling and shipping.

For more information about DSC Rod and Wire products . . . or DSC Sheet and Strip Steel . . . please write our General Sales Office or call your nearest DSC Customer "Rep" . . . today?

Customer Satisfaction Is Our Business

DSC MILLS AND PRODUCTS

PORTSMOUTH DIVISION, PORTSMOUTH, O.

Coke • Coal Chemicals • Pig Iron
Basic OH Steel Ingots • Blooms • Slabs • Billets • Rods
Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon
Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Strand
Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

35TH ANNIVERSARY YEAR

DETROIT STEEL

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DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:

Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio., Dayton, Ohio., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York, St. Louis, Toledo, Worcester, Mass., Winneconne, Wis.

Cost Crisis Competition

Today, the editors of STEEL are launching a cost crisis competition as a means of searching out ways of lowering production costs through the use of new or improved capital equipment.

This contest is tied in closely with STEEL's basic editorial philosophy. As a fundamental part of this philosophy, STEEL's editors regularly call attention to the current and impending problems affecting metalworking and offer suggestions for their possible solution or for mitigating their effects.

Such problems fall into two general categories:

1. Those of external origin over which management can exercise little or no control. They include the heavier tax burden made necessary by expanding defense requirements, tariff policy that encourages competition from low-cost foreign goods, and wage costs that are rising faster than productivity.

2. Those of internal origin over which management can exercise a higher degree of control. Problems associated with product design, production methods, and marketing procedures are prime examples.

In setting up the cost crisis competition, the editors logically decided to focus attention on unit manufacturing costs as the most fertile area for achieving savings.

It is the large area encompassing all the steps along the way in converting raw materials into finished products ready for the market. Cost savings do not necessarily involve a brand-new plant or a multimillion dollar transfer line. More often, they stem from the addition of a single piece of equipment, a change in existing equipment, better handling of materials in process, or improved plant layout.

You will want to report to the editors on any significant savings achieved for your company through improved production methods.

If you win, the award will include national recognition for you and your company. If you don't win, you still will benefit through the cross-fertilization of ideas via the pages of STEEL.

Remember that cost reduction is not a one-shot proposition, but a process that continues whether our economy moves up, down, or sideways.

Irwin H. Such
EDITOR-IN-CHIEF

1500-ton hydraulic free-forging press in operation at one of the leading mills for specialty steels. Manipulator is at left, high-pressure water station at rear, scale remover chute at bottom.

Because the new specialty alloy steels must be metallurgically perfect . . . Loewy forging presses

New alloys are coming into existence continually. Each is developed for unusual requirements—each has a different application.

Advances in the missiles field and in nucleonics demand the newest methods to produce these high-quality alloys. Specific service conditions, such as temperature range, stresses, corrosion by gases and nuclear liquids, all call for special properties—sometimes for unusual combinations of them.

Loewy forging presses assure metallurgical perfection of the product. It is generally agreed in the trade that—as one of our customers put it—our presses "*impart to special steels internal qualities never before achieved.*"

Loewy forging presses are designed for full accessibility of tooling, for easy supervision and maintenance. Fast closing, working and return speeds cut down idle time and prevent heat loss in the workpiece. Strokes per minute for planishing are unsurpassed by any other type of forging equipment. Pressure, tonnage and speed can be varied within a wide range to suit special requirements.

On Loewy presses, the machine parts exposed to the heat of the workpiece are protected and allow for thermal expansion. Heaviest eccentric loading is provided for. Any likelihood of fatigue failure is removed by careful design analysis. Loewy hydraulic forging presses have repeatedly proved that they outproduce hammers in working specialty alloy steels.

Loewy designs and builds open and closed die forging presses ranging from the much publicized 50,000-ton-capacity giant at Wyman-Gordon to a 660-ton midget in the same shop.

For information on how Loewy forging presses can solve your production problems, write us today, Dept. B-2.

Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON

Earnings Outlook for 1958:

A First Quarter Dip Due to:

- Weak demand.
- Mounting labor costs.
- High material costs.
- Rising service charges.
- Boosted shipping charges.
- Price competition.
- Soaring R & D costs.
- High inventories.

But a Less Gloomy Full Year Because of:

- A pickup in demand.
- Retirement of inefficient facilities.
- Use of more efficient equipment.
- Better inventory balance.
- Greater defense expenditures.
- Lower interest rates.
- Steady construction.
- High electrical sales.

Metalworking's 1957 Profits Started Downhill Slide

(Net Profit)

SELECTED MANUFACTURERS	1957	1956
American Motors Corp.	$11,833,200(d)	$19,746,242(d)
Birdsboro Steel Foundry & Machine Co.	880,403	868,768
Bliss & Laughlin Inc.	2,445,773	2,885,671
Budd Co.	8,865,807	9,165,274
Buell Die & Machine Co.	69,341	491,397
Case (J. I.) Co.	1,303,628	987,807(d)
Caterpillar Tractor Co.	39,784,655	55,404,378
Cessna Aircraft Co.	3,866,018	4,205,830
Cleveland-Cliffs Iron Co.	13,015,429	13,902,815
Cooper-Bessemer Corp.	5,338,832	4,842,202
Deere & Co.	28,681,610	20,058,457
Douglas Aircraft Co.	30,665,000	33,202,000
Dresser Industries Inc.	20,620,453	17,258,979
Foote Bros. Gear & Machine Corp.	1,083,440	1,178,085
Gar Wood Industries Inc.	513,623	1,006,122
Gillette Co.	25,900,000	31,544,304
Harnischfeger Corp.	3,809,765	3,257,344
IBM Corp.	89,291,589	68,784,510
International Harvester Co.	45,620,283	49,618,709
Johns-Manville Corp.	17,782,000	25,003,000
Joy Mfg. Co.	11,342,225	10,913,481
Kaiser Aluminum & Chemical Corp.	26,829,237	42,349,131
Kennecott Copper Corp.	79,222,594	143,154,210
Lamson & Sessions Co.	2,066,987	2,521,339
Maryland Shipbuilding & Drydock Co.	1,935,843	1,341,313
National-Standard Co.	2,506,318	2,757,937
Oliver Corp.	608,454	1,921,381
Porter (H. K.) Company Inc.	6,351,284	7,594,534
Rockwell Mfg. Co.	9,619,000	9,358,000

(d) Net loss.

SELECTED STEELMAKERS	1957	1956
Standard Forgings Corp.	965,928	1,013,252
Union Carbide Corp.	133,740,818	146,233,444
United Engineering & Foundry Co.	5,069,960	3,219,712
Westinghouse Electric Corp.	72,652,000	3,492,000
Woodward Iron Co.	3,329,000	5,590,755

Steelmakers Slipped, Too

(Net Profit)

SELECTED MANUFACTURERS	1957	1956
Alan Wood Steel Co.	$2,054,000	$3,096,000
Allegheny Ludlum Steel Corp.	11,651,851	15,261,090
Armco Steel Corp.	55,044,000	65,593,182
Barium Steel Corp.	3,212,000	(a)
Bethlehem Steel Corp.	191,025,933	161,411,625
Colorado Fuel & Iron Corp.	14,236,851	12,727,529
Copperweld Steel Co.	2,769,855	4,106,039
Granite City Steel Co.	9,984,000	15,109,411
Inland Steel Co.	58,876,875	52,998,726
Jones & Laughlin Steel Corp.	45,452,000	45,122,000
Kaiser Steel Corp.	21,439,000	23,572,000
National Steel Corp.	45,518,884	52,502,422
Pittsburgh Steel Co.	4,155,000	6,225,000
Republic Steel Corp.	85,014,422	90,406,665
Sharon Steel Corp.	4,046,773	6,905,530
United States Steel Corp.	419,073,722	348,098,916
Wheeling Steel Corp.	12,078,000	17,672,000
Youngstown Sheet & Tube Co.	42,508,579	43,174,587

(a) Earnings in 1956 not comparable due to "spin-off" of Republic Industrial Corp.

'58 Profits Won't Equal '57's

METALWORKING'S profits dipped in 1957's third period and fell even more last quarter. They'll take a bigger nose-dive this quarter. The second three months of '58 could bring some improvement and a gradual uptrend should begin around midyear for most firms.

A few companies had record earnings in 1957, but the majority saw their profit margins narrow substantially.

Steel — Two out of three steelmakers reported lower earnings in 1957 than in 1956—despite the '56 strike. But most steel company presidents think the decline has hit bottom. Roger M. Blough, chairman, U. S. Steel Corp., notes that orders are leveling off and in some sectors "moving just a little bit on an upward trend."

Avery C. Adams, president, Jones & Laughlin Steel Corp., says that J&L expects its lowest operations in

the first quarter and that each succeeding quarter will show improvement. A. B. Homer, president, Bethlehem Steel Corp., sees the possibility of a five-point increase in the operating rate in March. C. M. White, chairman, Republic Steel Corp., expects "operations later in 1958 to be at a considerably higher rate."

After a hard look at the figures, steelmakers are cutting costs up and down the line. Most low-efficiency plants are idle so the industry's profit per sales dollar will improve.

Outlook—Other metalworking industries face more erosion of profit margins this quarter but look for considerable improvement before the yearend. Although a few firms still predict record earnings for 1958, most expect to settle for substantially less than they reaped in 1957. Here's how '58 earnings trends look:

Autos—Weak demand plus the likelihood of a strike dim automakers' chances of matching their '57 profit pace. Higher labor costs as a result of upcoming negotiations with the United Auto Workers will bite deeply into second-half income.

Appliances — Most electrical appliance firms look for 1958 sales to exceed 1957's. But fierce competition will keep earnings from rising proportionately.

Farm Equipment — As farmers' purchasing power increases this year, major equipment producers look for a rise in sales. This industry, among the first to decline, will be among the first to recover. Earnings will keep pace.

Aircraft — The defense budget holds the key here. Most firms expect to equal or exceed their '57 earnings—unless wage costs climb too high as a result of current negotiations.

Nonferrous — Some improvement will come later in the year. Overproduction coupled with weak demand pushed prices down. Earnings plunged.

Capital Goods — Although most firms expect orders to start trickling in a little faster in the third quarter, they don't expect a fast enough pickup to keep profits from sinking to their lowest level in recent years.

Construction—Spring pickups in housing starts, road building, and public works construction will more than offset declining industrial expansion.

With Explorer overhead, industry should be ready for the . . .

Coming Shift in M-Day Plan

GORDON GRAY, defense mobilizer, will soon tell industry about new plans for mobilization. The Office of Defense Mobilization's Special Stockpile Advisory Committee reports: "As nuclear attack is today a distinct possibility and threatens the very survival of the American people, this nation must attain and maintain a position of preparedness that is flexible, balanced, and within its capabilities."

Those words, plus the launching of a U. S. satellite, set the tone for ODM's new look—a look designed to ready the U. S. for life in the age of small nuclear weapons and reconnaisance satellites.

Joint Chiefs Speak—At ODM, the Pentagon, and Commerce Department, word of the latest revision of our war plans by the Joint Chiefs of Staff is starting to filter down. Government statisticians and expediters are readjusting their programs in line with a declaration by the joint chiefs that we can face two types of emergencies: 1. The all-out nuclear attack which would kill over half the population and cripple industry. 2. The limited war with small nuclear weapons which might last up to three years.

For Survival—In case of an all-out attack, the stockpile committee wants: 1. An increase in the stockpile of items for survival and relief. (We now have about $200 million worth of medical supplies.) 2. Federal encouragement for the medical equipment, utilities, and construction industries to carry above-normal equipment stocks.

Mr. Gray's committee does not mention shelters for protection from radioactive fallout.

New Philosophy—While the Gray committee recommends that contracts for future delivery of metals in excess of a three-year supply be terminated, a committee spokesman emphasizes that negotiating should be on a company basis, designed to make everyone happy, not just the government.

No Dumping—The committee does not recommend dumping of stockpiled metals and minerals which can be upgraded to stockpile standards, even if current stocks are above the three-year supply. "As long as we have the stuff, we might as well keep it, because we don't know how requirements can change in the next decade," says a spokesman.

Some of the metals not up to rigid stockpile specifications set by the General Services Administration under the Defense Production Act: One-tenth of its inventory of aluminum; all its chrome; all its cobalt-nickel alloy; one-fifth of its columbium-tantalum; most of its

copper; three-fifths of its metallurgical manganese; all of its tin and titanium; and one-third of its tungsten.

(Note that stockpile standards may be higher than some commercial ones.)

Special Metals—What portion of the Gray committee recommendations are to be made law depends upon Congressional thinking. ODM will not attempt to go against Capitol Hill's wishes, guess experienced observers, but the lack of interest in the tungsten industry's case last year in the House gives one clue.

Two Goals — The committee wants the stockpile measured in terms of two three-year goals—the first on the basis of western hemisphere supplies; the second, sources in the Free World. Where we don't meet the first goal now, materials should be purchased quickly.

Machine Tools—The committee had nothing to say about the government's $3.5 billion worth of machine tools, but agitation within ODM for increased disposal is mounting. Officially, the U. S. will sell 11,000 tools this year and 12,000 next. Unofficially, the number could be doubled. Reluctance to kick the machine tool industry while it's down is about the only thing holding up the larger program.

Consensus—With a U. S. satellite aloft, you have a symbol of the space-nuclear age war planning now proceeding in Washington. The Gray committee operated under the assumption that we would never need to hump our economy with a war effort amounting to more than 20 per cent of our gross national product. (Today's $40 billion defense budget is about 10 per cent; in World War II, the effort was 50 per cent of GNP.) The obsolescence of modern weapons makes a higher spending program unnecessary in any limited conflict, and we wouldn't have time to spend that kind of money under an all-out nuclear attack.

Sidelight—On the U. S. satellite: 1. The Army will get plenty of mileage out of Explorer for its claim to equality with the AF in research funds. 2. Advanced Research Projects Agency (our "Manhattan" project for space) may never come to fruition, especially with successful Navy and (late this year) AF-brand satellites.

Tool and Die Dollar Volume: A Fall from the Peak

Estimated by STEEL.

Photo Credit: NTDMA.

$1 Billion Year—Maybe

That's outlook for tool and die industry in '58. This bellwether may be conservative indicator for general economy this year as costs prompt cancellations of design changes

THE NATION'S 4000 contract tool and die shops enter 1958 with uncomfortably low backlogs and no sizable order upturn in sight. It's a safe bet they won't match last year's dollar volume of shipments (estimated by industry leaders at about $1.15 billion), and they're sure to drop far below their record 1956 pace (when volume hit over $1.2 billion).

A $1 billion year is possible, but at this point $950 million seems a more likely figure. Shipments started dropping off last June and, except for slight pickups in July and September, have been running 25 to 30 per cent below the previous year's level ever since.

Clouds Are Lifting—The decline in orders bottomed out in '57's last quarter and a slow but steady uptrend is forming. George Eaton, executive vice president, National Tool & Die Manufacturers' Association, estimates orders this quarter will be up 10 per cent from those of the last quarter, '57. He foresees an-

other 10 per cent increase by mid-year.

The current upslope can be traced to the automotive industry. After holding off until long past the normal contract time, carmakers are hurriedly placing orders—what there are of them—and demanding rapid deliveries. (They want the work finished by June 1, in case of a strike.) So if a shop had 18 to 20 weeks' leadtime on a die last year, it has to turn it out in 14 to 16 weeks this year.

That situation has the shopowners screaming about profit margins. Many of them have reduced their work forces but kept their most skilled (and best paid) employees. Shops lucky enough to garner big automotive jobs will now have to work 50 to 60 hours a week, often with double shifts, to meet the deadlines. It adds up to higher costs per unit of output.

Squeeze Tightens—One large Detroit firm notes its direct costs are up 6 per cent, its prices down. Average price quotation in Detroit last year was $7 to $7.50 an hour; this year, it's closer to $6. Ford has reportedly told die shops it would buy at no more than $5.50, although some established suppliers are getting more.

The owner of a large Chicago shop sums up the profit problem this way: "The going rate for tooling work was $7 an hour last year; this year most firms have cut their price to $6. Meanwhile, our costs have climbed. We're happy now if we make 10 per cent on a $200,000 job where we used to make 15 per cent."

Crux—There isn't enough automotive work to go around since none of the Big Three divisions is planning wholesale changes for '59 models. Chrysler is restyling most of its cars more than it had originally planned (STEEL, Feb. 3, p. 77), but informed sources report GM and Ford are dropping some scheduled changes.

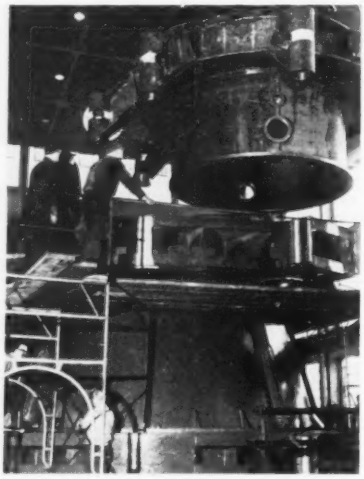
No other industry has placed sufficient orders to take up the slack. Bright spot: With competition severe, some electrical appliance makers are redesigning products to attract consumers' attention.

Late Help—Many firms are looking to the rising national defense budget as a source for orders. But few expect much help of that sort until late in the year. Shops doing production work, however, report lucrative business in supplying special parts for missiles. Some firms look for rising sales to builders of nuclear reactors.

Threat from Abroad? — Two UAW locals in Detroit have asked Sen. Patrick V. McNamara (D.) and Sen. Charles E. Potter (R.), both of Michigan, to investigate "how many jobs are being done in foreign countries, taking away thousands of jobs in this area." Automakers have been ordering about 7 or 8 per cent of their tooling abroad to work off profits of foreign subsidiaries which they weren't able to bring into the U. S. STEEL got other scattered reports of foreign competition from firms claiming dies are being made abroad for U. S. makers of cameras, office machines, and instruments.

German tool and die makers are paid 80 to 90 cents an hour vs. about $3.50 paid U. S. craftsmen. But transportation costs, expense of making engineering changes, and other factors narrow the differential considerably. Compared with domestic dies, industry leaders figure the saving on the final cost of foreign dies is 10 per cent or less.

Representatives of Mercedes-Benz visited Detroit shops to find out how we make dies. They say they can't always buy good dies in England.



A SHIP MOTION SIMULATOR, capable of producing on land the ship or submarine motions which occur at sea, is being built by Bethlehem Steel Co. One of the Navy's important tools for the guided missile program, it will be installed soon at Cape Canaveral, Fla. Designed by Loewy-Hydropress Div. of Baldwin-Lima-Hamilton Corp., it will be 36 ft high and weigh 285,000 lb

Exports of U. S. dies to Canada and Mexico are still on the increase although sales elsewhere are slowing down. However, exports of special machines are mounting. Example: Barth Corp., Cleveland, reports its export sales rose from the normal 3 per cent of total volume to 10 per cent in 1957. Reason: The firm is building special machines for the lamp and bicycle industries in Japan, Holland, and England.

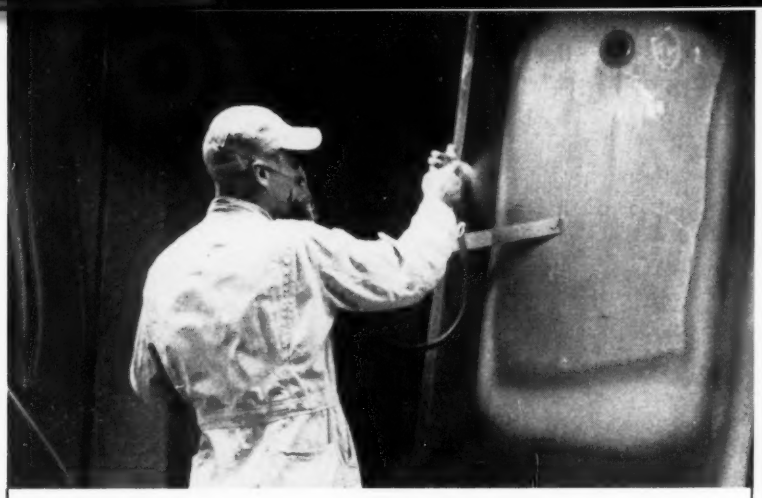
Plastics—Laminated plastic dies can give up to 100,000 impressions, reports the American Society of Tool Engineers. But not too many uses have been found for them in high-production lines yet. Main advantages: Parts can be tooled faster and modifications can be made easier. More high-production applications are being found for plastic jigs and fixtures. So are plastic die components such as shedders. They can be cast in the die cavity, eliminating tedious machining and fitting, says ASTE. It adds: Service life as long as 100,000 pieces has been attained using epoxy shedders in a blanking die.

Things To Watch—These developments may affect the industry in 1958. 1. Look for increasing use of carbide inserts at critical wear points. 2. Explosive forming may move into the production stage this year. 3. Expect more savings through ceramic cutting tools. (ASTE reports the technique is saving over $100,000 annually on one job.) 4. Watch for the results of government-sponsored basic research at Lockheed Aircraft Corp. on tests where cutting speeds exceed 110,000 sfm. 5. More uses will be found for ultrasonic and electrodischarge machining and electronic etching. 6. Look for easier money in the first half of 1958 to aid builders of special machines. 7. Shipments of die-casting dies should continue to rise.

Sidelights — Many tool and die shops intend to drop the seven-day week entirely; absenteeism cuts efficiency too much.

Price cutting isn't limited to "alley operators." Old established firms are doing a lot of it these days.

Less than 95 shops have over 100 employees but this group accounts for 35 per cent of the value added by manufacture in the industry.



Fixture Sales Tie in with Home Starts

	1955	1956	1957	1958*
Housing Starts	1,328,900	1,118,100	989,100	1,080,000
Plumbing Fixture Sales, (millions)	$363	$346	$315*	$330
		Housing off 15.8%, fixtures only 5%	Housing off 13%, fixtures 9%	

*Estimated by STEEL. Source for other years: Bureau of Labor Statistics (housing), Plumbing Fixture Mfrs. Assn. (fixtures). Photo credit: Eljer Div., Murray Corp. of America.

Plumbing Sales Will Revive

Manufacturers base their optimism on the rise in housing starts this year, more sales per home, product improvement, and a pickup in the construction of apartments

PLUMBING FIXTURE manufacturers think they've halted the two-year sales dip that accompanied slowness in housing starts in 1956 and 1957. They have good reasons to predict that this year will be one of expanding sales. For example:

1. More Homes—"We have not built a sufficient number of homes to take care of the bare minimum requirements of our expanding population and to replace worn-out housing which has gone out of use," says George S. Goodyear, president, National Association of Home Builders, Washington.

"Liberalization of mortgage money will help increase housing starts in 1958," predicts E. O. Brady, vice president, special sales, Briggs Mfg. Co., Detroit.

2. More Sales Per Home—The trend to added comfort in the home continued while housing starts dipped in 1956 and 1957. The Plumbing Fixture Manufacturers Association, Washington, points out that the average number of bathrooms per home rose from 1.2 to 1.5 between 1954 and 1956.

"The public's continued demand for more plumbing fixtures in the home and the emphasis on remodeling should improve business for fixture manufacturers," agrees Stanley S. Backner, vice president, Universal-Rundle Corp., New Castle, Pa.

3. Product Improvement — "Trends toward greater use of colored plumbing fixtures and home improvement trends will have beneficial effects on industry sales levels," reports John J. Hall, vice president, Rheem Mfg. Co., New York.

Eljer Div., Murray Corp. of America, Detroit, promotes such new products as a tub with a seat for children, elderly people, and invalids. A new lavatory has a pull-out step for children.

4. More Apartments — "There's greater momentum in multifamily dwellings. In this area, more and more multistory apartment buildings are built. Demand is for three or four bedrooms with two baths because many families are large," says G. R. Kinnally, general manager, jobbing division, James B. Clow & Sons Inc., Chicago.

Fixture manufacturers interviewed by STEEL were cautious. Their average prediction is a 5 per cent sales gain in 1958. It would boost volume from an estimated $315 million in 1957 to $330 million this year.

Moderate Gain — "Over-all, the 1958 outlook shows the possibility of a slight improvement over last year's sales. Although there will be an increase in housing starts and more apartment units will be built, the trend toward a bathroom for every bedroom will not be completed in 1958," reports Carter T. Pollock, vice president, plumbing sales, Crane Co., Chicago.

"Remodeling represents a big potential and should show added volume in 1958 and beyond. Institutional building should continue to improve in 1958," Mr. Pollock adds.

Also optimistic is E. A. Headland, manager, plumbing ware sales, Enamel Products Co., Cleveland. He says: "We had a better year in 1957 than in 1956, and we expect an increase again in 1958. Building should pick up in February."

Too Much Capacity?—While a $330-million sales year would be the third highest in history (topped only by $363 million in 1955 and $346 million in 1956), most pro-

ducers told STEEL they doubted that competition will ease up this year. As one manufacturer explains: "Many new plants, particularly potteries, have been added. The industry's capacity is far in excess of the anticipated market."

"Competitive pressures result in a wave of price slashing, trimming profit margins. Both manufacturers and wholesalers suffered from overstocks after sales declined last year," adds another firm.

More Competition — Manufacturers who complain of competition this year may encounter a new rival by 1960. Sales officials at Aluminum Co. of America, Pittsburgh, are eying the plumbing fixture market. They plan to sell porcelain-enameled cast aluminum to producers of lavatory sinks and tubs within two years. "Some cast aluminum wash bowls and toilets already find uses in prisons, where they withstand rough treatment," Alcoa reports.

Despite continuing competition, which resulted in some plant shutdowns and layoffs in January, plumbing equipment makers think they have weathered their slowest month of the year. As Mr. Kinnally says: "I know we are going to have a good year in 1958, but we realize we will have to work harder to have it."

Hotpoint Looks Ahead

Hotpoint Co., Chicago, started construction of the first appliance factory in the company's latest expansion program. John C. Sharp, president, said it is necessary to start building new facilities now to meet the appliance needs of the growing population.

The first factory, scheduled for completion in 1958, will start producing a new type refrigerator compressor in 1959. Initially, it will employ 300 to 500. Other plants and offices to go up on a 770-acre tract northwest of Chicago are in the planning stage.

Vacuum Melter Expands

Utica Metals Div., Kelsey-Hayes Co., is moving equipment into its new 110,000 sq ft plant southwest of Utica, N. Y. It will be in full production about Mar. 1, 1958.

Avis Rent-a-Car System and Ford Motor Co.

Fleet Owners' Average Car Costs

	1st Year	2nd Year	3rd Year
Maintenance*	$125.00	$150.00	$200.00
Insurance	130.00	125.00	115.00
Sales Tax	44.50	x	x
State License	20.00	20.00	20.00
Personal Property Tax	42.00	30.00	20.00
City License	4.00	4.00	4.00
TOTAL	$365.50	$329.00	$359.00

*Includes tires and batteries, but not gas and oil.
Based on a new car valued at $2,225 driven 10,000 miles per year.
From AAA, AMA, and NADA statistics.
Costs will vary because of different insurance and tax rates.

Should You Lease—or Buy?

The answer depends upon your company's particular needs and method of operation. This story points out some factors to consider before you decide

LEASING rather than buying company cars offers tax advantages and capital savings.

Commerce Clearing House, national authority on tax and business law, reports firms are trending toward an equipment lease plan (cars are operated as if the company owned them, but the leasing firm keeps the title).

Thus, leasing cars is a tax deductible business expense while purchasing them usually is a capital expenditure subject only to depreciation deductions, explains CCH.

More Lessees—Michael Braude, president of Emkay Inc., Chicago leasing firm, estimates 170,000 fleet-leased cars will be in operation this year, vs. 150,000 last year and 132,000 in 1956.

Samuel J. Lee, president, Lee Fleet Management Inc., Cleveland, adds that at least 100,000 of them will be handled through 20 national lessors and the rest through local outfits.

More Lessors—CCH says 700 companies are in the business. There will be more because Lee is franchising 100 car dealers to handle local leasing.

Truck leasing is growing too. National Truck Leasing System Inc., Chicago, estimates 272,200 leased

trucks are now in operation, vs. 225,000 in 1956. Firms leasing or renting cars and trucks number 2200. Their income exceeded $400 million last year and they look for a 12 per cent increase this year.

More Sales—Leased cars accounted for less than a quarter of the 750,000 cars sold for fleet and rental use last year but Mr. Lee figures lessees are increasing at a 10 per cent annual rate. Other sources figure leased cars account for a third of the country's estimated 140,000 company fleets.

Leasing and renting boost carmakers' fleet sales. For this quarter alone, GM's Chevrolet Div. expects to sell 50,000 cars to fleet owners. In the like period last year, fleet sales totaled 54,600 for Chevy, 55,300 for Ford and 21,500 for Plymouth.

More Competitors — Recently American Motors Corp.'s Rambler has been making itself felt. An insurance company report shows the car costs $149 to $454 less to buy, operate, and sell than other low-priced vehicles.

William B. Ramsey, director of AMC's fleet and government sales, expects to peddle 10,000 cars to fleet owners this year—a 50 per cent increase over 1957. He believes fleet cars can account for 25 per cent of Detroit's output by 1962.

Plans Differ—Fleet leasing is usually done with 35 or more cars through equipment trust leasing (ETL) plans. Flat-rate leasing is aimed primarily at individuals. It's basically long term renting. It usually includes maintenance and it costs about $300 to $350 more a year than ETL.

Hertz Corp. and Avis Rent-A-Car System Inc., Chicago, are typical firms making short term rentals to companies and individuals. They also do some leasing.

Quick Comparisons — Because each company's needs are different, it's almost impossible to give direct cost comparisons between company-owned, salesman-owned, and leased fleets. You can fill in the chart at right to get annual operating costs of cars owned by your salesmen or company. Compare this with the national average leasing rate of about $780 a year per car (excluding insurance).

On the surface, leasing may cost a few more dollars than maintaining your own vehicle, but some indirect savings can make it more attractive. Examples:

Salesman-Owned—One company came to Mr. Lee when it found that it had loaned its salesmen more than $133,000 to help finance car purchases. Many other firms overpay on mileage allowances to avoid bickering and dissatisfaction among sales crews.

Company-Owned—A major appliance manufacturer switched to Lee's leasing last year after owning a fleet for almost 40 years. Asked why, the firm replied: "We just don't know how to operate a fleet economically!" Says Mr. Lee: "It should cost between 6 and 6.25 cents a mile to operate a company-owned car."

If your salesmen work from a central base, or if you keep garage and maintenance staffs for trucks, you're probably better off not leasing. But if you have nationwide sales territories or little experience in fleet operation and maintenance, you should investigate ETL.

What ETL Is—Explains Mr. Lee: "Under this system, a vehicle is purchased for a fixed sum to which is added: 1. Transportation cost to the salesman's home. 2. License plates. 3. Taxes. 4. Miscellaneous expenses.

"This sum is capitalized and the lessee is billed at a monthly rate (about $65 per car). It includes a predetermined depreciation rate plus service and finance charges. The depreciation payment shows the book value of the car at any time so it can be turned in when its market value still is on the plus side (usually between 12 and 15 months)."

Results—Salesmen take care of maintenance, insurance, and all operating expenses. They may be reimbursed at a 2 or 3 cents per mile rate.

The leasing agency acts as an expert service representative to handle buying, selling, delivery, and all paperwork. It buys at wholesale prices when the market is right and has its own used car outlets.

Advantages — Companies who lease don't have to spend capital funds for autos. And they know exactly how much they'll be paying for cars each month.

Salesmen can have any kind of car they want with almost any equipment and in any color. Many lessors now offer both high and low priced cars under one plan. This helps firms who need some prestige cars.

In seven states, leasing agencies don't have to pay sales tax, which saves $60 to $80 annually per car.

What Are Your Vehicle Costs?

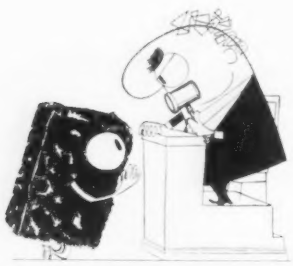
(Fill in applicable blanks)

Fixed Expense	Per Year
1. Total capital investment	$
2. Interest on investment	
3. Financing charges	
4. Depreciation	
5. License tags	
6. Property taxes	
7. Fire and theft insurance	
8. PL & PD insurance	
9. Collision insurance	
10. Garage rent & utilities	
11. Garage equipment & supplies	
12. Equipment depreciation	
13. Garage labor	
14. Garage supervision	
15. Office work & administration	
16. Time lost from breakdowns	
17. Road service	
18. Special equipment	
19. Miscellaneous costs	
TOTAL FIXED COSTS	$

Mileage Expense*	
20. Gasoline	
21. Oil	
22. Grease	
23. Tire and tube costs	
24. Replacement and repair parts	
25. Outside repair costs	
26. Antifreeze and tire chains	
TOTAL MILEAGE COSTS	$
TOTAL COST PER YEAR	$

*For salesman owned cars, substitute mileage reimbursement.
Adopted from NTLS forms.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Scrap Dealers Charge Discrimination

WHILE the railroads fight a big battle on Capitol Hill for federal subsidies and tax relief, they are also in the middle of a small skirmish down Constitution Avenue at the Interstate Commerce Commission.

Seeking a hike in bulk freight charges "to keep from going bankrupt," the roads have run smack into 1300 scrap dealers (represented by the Institute of Scrap Iron & Steel) and Howard Gould, Cincinnati lawyer (who is voicing the feeling of several steelmakers who are heavy scrap users and do not have their own iron ore supplies).

The scrap dealers charge "discrimination," because the proposed 40-cent a ton increase on scrap shipping is higher than a maximum 25-cent a ton boost set for iron ore. Because ore is turned into pig iron, scrap's competitor, the scrap industry and some scrap users are aroused. This, says Mr. Gould, is "milking the cow until the cow drops dead." Furthermore, say the scrappers, no rate increases are proposed for finished iron and steel products, and movement of scrap between "some plants of certain large steelmakers has been exempted."

They'll Take It to Court

If ICC grants the "discriminatory" increase, the scrappers promise to go to court; the nonintegrated steelmakers are considering the same route. The dealers are "in the talking stage" of a mutually owned truck and barge corporation as a substitute for the rails.

The roads picked up $95 million from scrap shipments in 1955.

ICC has warned the roads that they can't get along with a continuing policy of boosting rates and declining shipments: "The initiation of measures, both in pricing and service, to retain and increase traffic is plainly a responsibility of carrier management."

The railroads have been telling Sen. George Smathers' (D., Fla.) Surface Transportation Subcommittee that they no longer need to be treated like monopolies: They should be allowed to cut rates as they see fit to meet competition. Their action on the scrap increase won't help that case before Congress. The small businessmen's angle is sure to be raised when the roads' proposals get to the floor. And the scrap dealers' protests will be remembered.

When the truckers come before Senator Smathers this week, they are certain to cite their own small business standing.

Thus far, the Commerce Department has refused to take sides, but Senator Smathers will force a statement.

Keeping Your Eye on the Moon?

Within a few years, five at the most, say some experts, the moon will become a symbol of hatred to a large part of mankind.

Reason: An enemy stationed there will control this planet. Here's how Brig. Gen. Homer Boushey, deputy director, Air Force Research & Development, looks at the moon:

1. It is an ideal observation station because it lacks atmosphere. 2. It can be reached from Earth in a little over two days. 3. Only half of it can be observed from Earth. 4. Velocity needed to leave it is about one-fifth that required to leave Earth. 5. A missile launched from it could be guided all the way to Earth (weather conditions and Earth's rotation interfere with guiding a missile from Earth to the moon).

General Boushey concludes that if the U. S. holds the moon, Russia would be forced to telegraph any attack on us by launching an attack at the moon first. On the other hand, Russian control of the moon would give her an extra chess piece: If she attacked the U. S. from Earth bases, and was hit by our retaliating forces, her moon forces would remain to clean up. Antimissile missiles would be a good deal more accurate and easy to operate on the moon, too.

Jackson Estimates Our Defenses

"If we kept 50 Polaris submarines at sea all the time," says Sen. Henry Jackson (D., Wash.), "they could become the Free World's main deterrent and retaliatory force." The senator is pushing for funds this session to start 15 such subs; the Pentagon has indicated nine are planned.

Other recommendations: A speedup in nuclear subs, B-52s, B-58s, and K-135 tanker planes, four new Army divisions, and increased missile production. Aware of the tendency to hold off production while improvements are made, he thinks we should freeze our designs more quickly: "We can take the calculated risk of going into mass production before every minute item of the missile has been tested."

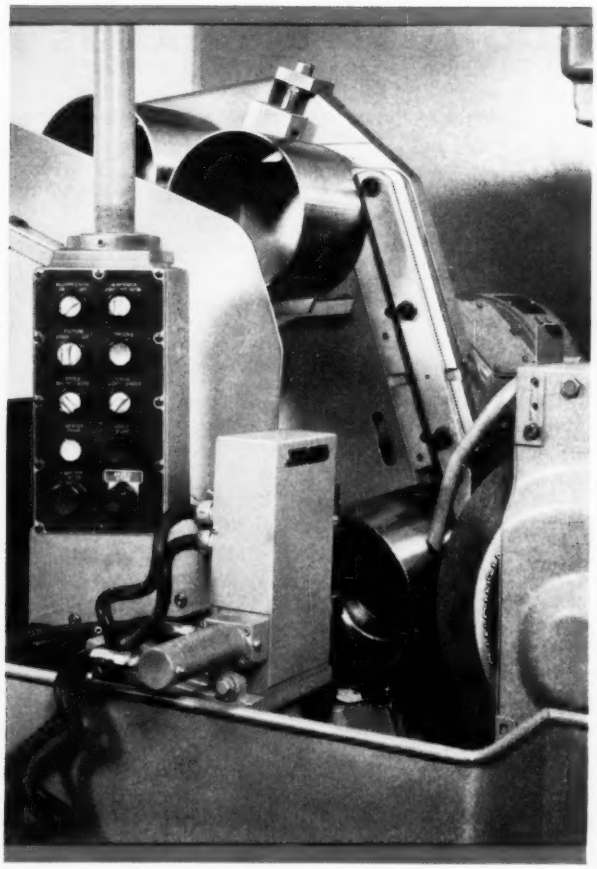
600 Million Tons of Bauxite in Hawaii

Congress is considering legislation to exploit bauxite deposits amounting to ten times U. S. reserves. The Hawaiian legislature passed an act to develop reserves estimated at 600 million tons. Says Assistant Secretary of Interior Roger Ernst: "If any important proportion of these deposits can be commercially developed, they would be sufficient to provide raw material for all American needs for bauxite, alumina, and aluminum for many decades. If foreign supplies to the U. S. were cut off, domestic supplies of high grade bauxite would last five years at present consumption rates."

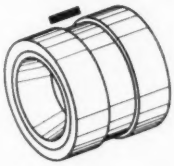
Large Anti-Friction Bearing Rings

are ground perfectly round

on the Cincinnati Filmatic Micro-Centric



Micro-Centric grinding applied to large parts up to 10" diameter. Loading and grinding are automatic for the operation of grinding a narrow section to perfect roundness.



Drawing of part. Diameter ground is indicated by heavy line.
Part name . . . . . anti-friction ring
Production . . . . . 40 per hour for 10" rings

FILMATIC

Perfect roundness is a tough specification for any high production grinding operation. And the larger the part, the more difficult the specification becomes for ordinary grinding methods. A prominent manufacturer of anti-friction bearings solved the problem by enlisting the aid of Cincinnati Grinding and Automation Specialists. The job of grinding the center section of 10" diameter rings was assigned to a CINCINNATI® FILMATIC No. 2 Micro-Centric. ¶ The machine is tooled up for automatic production, and includes several cost-reducing features such as automatic loading fixture, adjustable for 6" to 10" diameter range . . . automatic reciprocation for grinding wheel spindle with interlock for truing . . . automatic cross feed compensation to maintain constant length of cycle. ¶ This equipment is typical of the fine grinding machines and modern tooling available at Cincinnati. Our specialists are ready to give you the benefit of their experience in six distinct types of precision grinding: centertype, centerless, chucking, Micro-Centric, centerless lapping, roll. Make Cincinnati your headquarters for fine standard and special precision grinding machines. It's to your advantage to do so.

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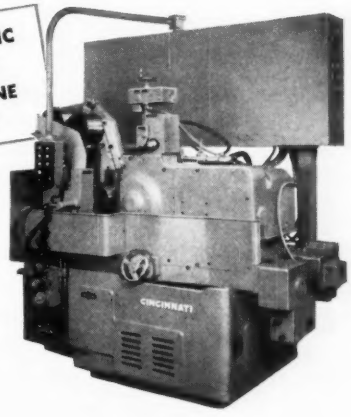

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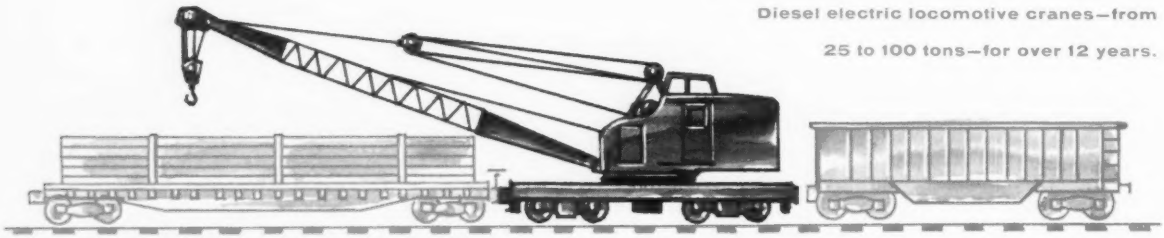
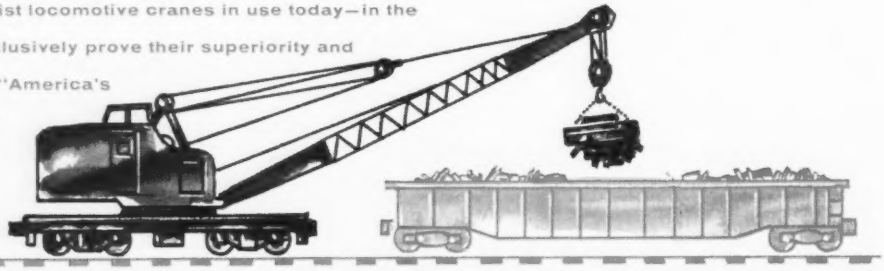


The thousands of Brownhoist locomotive cranes in use today—in the largest corporations—conclusively prove their superiority and their earned reputation as "America's No. 1 Locomotive Cranes."



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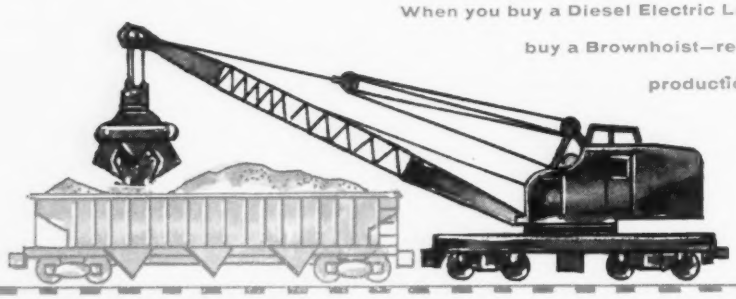

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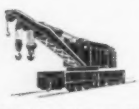
BROWNHOIST

CLAMSHELL BUCKET



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Copperweld Looks Ahead

Merger with Superior Steel provides new market, but $15 million expansion cut income in 1957. New equipment, more space, and a wider scope make long term profit outlook bright

COPPERWELD Steel Co. is laying plans for the next boom in steel. The Pittsburgh firm took a cut in its profits in 1957 with the objective of making more profits in future years.

President James M. Darbaker says 1957 earnings were trimmed by costs of breaking in extensive new facilities during the company's $15-million expansion program completed last year. Production halted at the Steel Div., Warren, Ohio, to start up a 35-in. blooming mill and put new soaking pits into use. Operations at the Wire & Cable Div., Glassport, Pa., were slowed to start up an improved rod mill.

Look Beyond 1958—Ending now are production bottlenecks caused by the expansion drive. As the result of merger with Superior Steel Corp., Carnegie, Pa., late in 1957 and installation of new facilities, Copperweld officials expect to take better advantage of the next boom in metalworking. Expansion of semifinished capacity, improved finishing equipment, and a broader range of finished products will enable the firm to give better service to more growing industries in coming years, they add.

Copperweld encountered declining market conditions last year, as did most of the steel industry. For example, utilities' purchases of copper-clad steel wire dropped. Demand fell for some of the firm's other products, which include alloy and carbon bars and tubing. Mr. Darbaker reports that decreases in demand resulted mainly from customer inventory liquidation and less government defense spending.

Lower Sales—Copperweld's net sales for 1957 totaled $121.1 million, (including Superior's $28.2 million), vs. combined sales of $129.5 million in '56. Net income dropped from $4.1 million in 1956 to $2.8 million in 1957.

Not content to wait for demand to catch up with capacity, the firm is preparing now for expected stronger years ahead. First step is addition of new rolling capacity. Second step is broadening the product line to use that capacity.

New Units—Expansion brought enlarged electric melting furnaces, new heating units and rolling mills, expanded conditioning and finishing equipment at Warren, a new rod mill at Glassport, and a controlled atmosphere, roller hearth furnace at Ohio Seamless Tube Div., Shelby, Ohio.

With a new blooming mill at Warren, Copperweld can roll the stainless, alloy and high carbon steel billets and slabs which the Superior Div. will require for its hot and cold rolled strip production. The acquisition provides a new outlet for Copperweld's semifinished steel, as the firm had not been a supplier to Superior in the past. Warren's capacity is now 460,000 tons annually, 43 per cent higher than before the expansion.

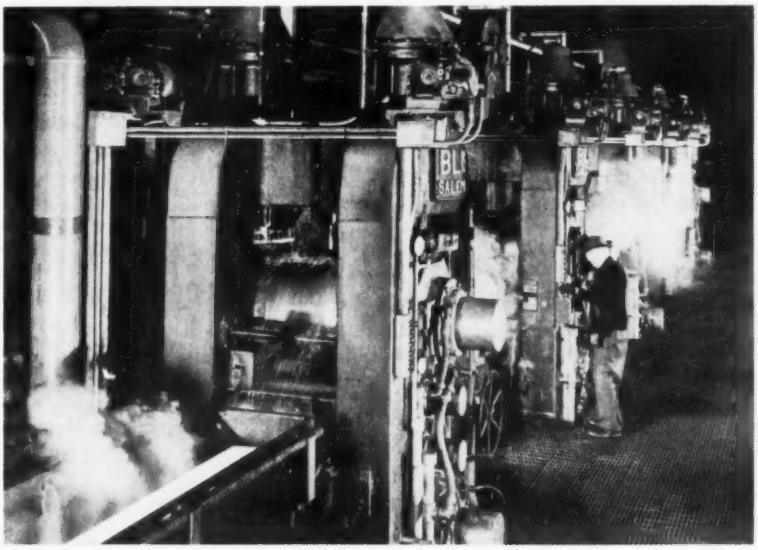
Growing Markets—Superior provides Copperweld an outlet in the growing stainless steel market. Superior's stainless strip finds applications in automotive, appliance, cutlery, and hardware industries.

Looking ahead, sales officials predict an improvement in demand later this year for wire, now off "moderately" from year-ago levels. Strip sales to automakers continue dull, but when that industry's purchasing grows, Copperweld will be able to supply additional tonnage.

The company has also continued its emphasis on research with alloys and bimetallic wire. It says it is "much interested in the growing fields of special materials, such as boron stainless, zirconium, Zircaloy, and beryllium copper."

Mr. Darbaker sums up: "As the economic trend improves, we will be in an excellent position for substantial benefits from expansion and integration with Superior.

"It's easy during a period of low sales to say: 'Don't worry. Things are going to get better.' It's something else to back that belief with an investment of millions of dollars, as Copperweld has done . . . I think the greatest opportunity in the history of the steel industry lies in the years ahead." He adds: America will annually consume 130 million tons of ingot steel by 1967—"and that's a conservative figure."



Superior Div.'s 20-in. hot rolling mill for clad metal and other products

Announcing STEEL's

COST CRISIS

A Cost-Critical Year

Metalworking is facing its most challenging crisis since World War II. It's the COST CRISIS —created by leveling or shrinking sales volume, greater resistance to price increases, and continuing upward cost pressures.

Are You Beating the Cost Crisis?

Has your company achieved an important saving in unit production costs through more efficient use of capital equipment? Your success can bring national recognition to you, your production team, and your company. All you need to do is tell us about it.

Editors Launch Nationwide Search

. . . to highlight the need for intelligent cost cutting of this type, and to show readers how it's being done, STEEL's editors are looking for dramatic examples. The best entries will be reported in STEEL.

Special Honor for the 'Top Ten'

A distinguished panel of 100 STEEL readers will select the "Top Ten" published entries. *Production Efficiency Awards* will be presented to the president of each winning company for encouraging production, engineering, and purchasing supervisors to find ways to cut production costs through more efficient equipment.

Entries will be classified by plant size. Two *Production Efficiency Awards* will be made in each of these groups:

Plants employing under 100
Plants employing 100 to 249
Plants employing 250 to 499
Plants employing 500 to 999
Plants employing 1000 or more

Your entry competes against only those from plants of equal size.

You May Qualify for an Award

. . . if you are a full-time employee of a metal producing or metalworking plant

. . . if you participated in the unit production cost saving project

. . . if your project was completed since Jan. 1, 1952 . . .

AWARDS

Competition

To find new ways to lower unit production costs through efficient use of new or improved capital equipment.

Send for Your Awards Kit Today . . .

It is designed to simplify your job of preparing an entry. Included are a questionnaire on which you can submit your answers and a folder in which you can mail your entry to us. Here are the questions you'll have to answer:

1. WHAT WAS THE COST PROBLEM? (Tell what product is being made, what production operations are involved in the cost reduction, and how you discovered cost-cutting possibilities. For example, was it part of a plant cost program, the result of vender information, or an employee suggestion?)

2. WHAT WAS THE PRODUCTION SEQUENCE BEFORE THE IMPROVEMENT? WHAT IS IT NOW? (Include a description of equipment improvements or purchases made, tooling alterations, material changes, or other steps that influenced the unit production cost.)

3. WHAT ARE THE "BEFORE" AND "AFTER" UNIT PRODUCTION COSTS? (If these figures are not available, tell what percentage of the old cost is being saved. If the change brought other gains, such as production rate or part quality, tell us about them.)

4. IF YOUR PROGRAM TOOK SEVERAL STEPS, WHICH WAS MOST RESPONSIBLE FOR THE SAVING?

5. HOW DID YOU SELL THE PROPOSED IMPROVEMENTS TO MANAGEMENT AND GET THE NECESSARY FUNDS? (Include, where possible, the dollar investment needed.)

Send us action photographs of the production operation or equipment and any drawings necessary to describe the improvement.

Be sure to give us your name, title, and the number of employees in your plant.

Entries Must Be Simple, Factual

All entries will be judged on the factual presentation of the case study. Elaborate entries are discouraged. All that's required are straightforward answers to the Awards Kit questionnaire.

Your Entry Can Be a Winner

To get your Awards Kit by return mail, write today to:

Cost Crisis Editor
STEEL
PENTON BUILDING
CLEVELAND 13, OHIO

All entries must be postmarked no later than June 15, 1958.

Star studded with economy features Cutler-Hammer Three-Star Unitrol

Standardized Modular Construction

All control units are 20" wide and in multiples of 14" in height. This permits easy interchange of various sizes and types of control units without rearrangement of the entire control assembly and avoids wasting space with dead panels to adapt non-uniform control units. This standardized modular construction also insures good appearance at all times because horizontal lines match.

No industrial today can afford to ignore the savings Unitrol now offers in the installation and use of motor control

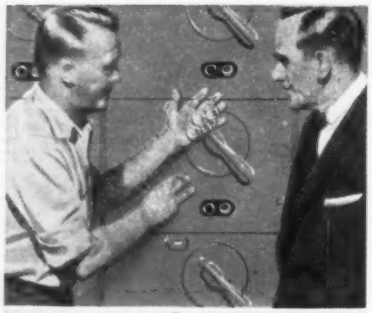
Cutler-Hammer Unitrol cuts costs from the moment it is delivered. It can save days, often weeks, in the time required for the installation of motor control. The high cost of mounting and wiring individual starters is eliminated. Earlier use of the production facilities brings a speedier return on the investment. Unitrol often effects vital savings in floor space, sometimes avoids the need for costly plant construction.

In performance, nothing can compare with the Unitrol. Feature after feature of the astounding Three-Star Control saves time and expense. Superlife vertical contacts *never* require maintenance care in all normal use. Adjustable overload relay coils let motors work harder safely, save the expense of both damaged motors and needless production interruptions. Full three-phase protection such as able engineers now demand is offered by three-coil overload relays.

Compare Unitrol with any other control centers and see the difference. See how sizes and types of control units can be interchanged in Unitrol without rearrangement of the entire assembly or the waste of space with dead panels. Saves time, saves space, saves money. Compare and you *too* will insist on Cutler-Hammer Three-Star Unitrol. Write or wire *now* for full information. CUTLER-HAMMER Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin.

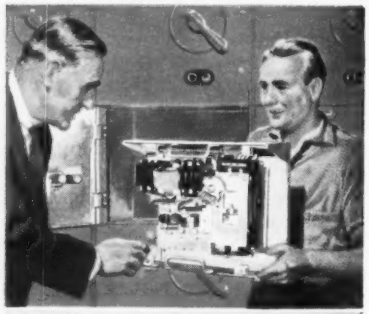
CUTLER-HAMMER
★ ★ ★
UNITROL
C-H

Unitrol plug-in feature disconnects control from power when unit is moved to test position, reconnects without misalignment when unit returns to operating position. Control panel is *always* vertical. Plug-in design permits back-to-back assemblies without staggering control units. Units are removed by merely disconnecting load and control wiring at terminal boards. This wiring is cabled, marked and color coded.



Unitrol provides either circuit breakers or fused disconnect switches of advanced design. Both have three-position self-aligning operators arranged for padlocking with as many as three locks in the "off" position. Recessed pushbuttons and concealed door hinges are typical features that add to safety and fine appearance.

The name UNITROL is a Cutler-Hammer trade mark



Components front of panel mounted without stacking. No crowding, no power connections near panel fasteners. Many Three-Star Control exclusives. Superlife vertical contacts *never* require maintenance expense in all normal control uses. Adjustable overload relay coils let motors work harder with safety. Full Three-Phase Protection with 3-Coil overload relays on standard size starter panels.

Standardization for '59 Means . . .

- **Single body shells**
- **More two-year facelifts**
- **Fewer engine changes**

Chrysler's experimental Plainsman hints at 1959 styles

STANDARDIZATION is the big word for '59. Detroit is discovering in these high cost days that it pays to make one part serve several cars. The auto companies naturally aren't talking about what will be on next year's models, but suppliers, tooling engineers, and designers are hinting at trends.

GM—General Motors Corp. is switching to a single body shell next year, say informants. Some persons consider it to be a body and a half, depending on whether quarter panels are counted. The cowl, A and B posts, and windshield area will be the same for all makes, but sheet metal will be different.

Door hinges reportedly are being cast into the A and C posts. This means rear doors will open toward the center as they do now on Cadillac's Eldorado brougham. The B post (center) won't have to carry heavy loads. It already has been dropped on two-door hardtops; can be eliminated for four-door models, too.

Dashboards with printed circuits will be another interchangeable item on all 1959 GM cars with the possible exception of Chevrolet. Instruments will be separately designed, however, and at first glance buyers shouldn't be able to tell that Pontiac and Cadillac are using the same dash. Some steering gear parts also are being standardized for all divisions.

Ford — Before the M-E-L Div. was formed, Ford Motor Co. was scheduled to buy 3500 dies for '59 cars, but that number likely is less now. Edsel uses parts from Mercury and Ford and the story is that Edsel plans even more standardization next year.

Detroit is pretty well convinced the top two Edsels are out. Presumably, this means its big E-475 engine (shared with Mercury) also will be scrapped.

Chrysler—It's too early to talk about styling changes, but Chrysler Corp.'s experimental station wagon, the Plainsman, is supposed to have some of the styling features the corporation will use on '59 cars.

As reported last week, Chrysler is making more of a change than autodom had anticipated. It's getting to the point where Detroit has to again reclassify what constitutes a facelift. This year, Chrysler has what might be called a minor facelift. It had planned a moderate change for '59; now is going for a major restyling of front ends—but it's still a facelift.

Small Shocks—The Forward Look firm is aiming at more interchangeability among electrical components. The rumor keeps cropping up that Chrysler will set up a separate electrical division in Ohio although the company scotched such talk a few months ago when it signed a three-year contract with Electric Auto-Lite Co., Toledo, Ohio, for starting motors, distributors, generators, and voltage regulators.

Electric Auto-Lite now reports it is closing its Evendale, Ohio, production plant this month and the Detroit rumor circuit wonders just what other clauses are in the contract between the two companies.

Both Chrysler and Ford are supposed to switch to alternating current next year. They'll use a direct current generator and converter. Power for lights will be taken directly from the generator; other electrical equipment will be ac. By 1960 or '61, it may be that electrically operated power steering will appear on Detroit's masterpieces.

Costs Are Key—High costs and lower profits seem to be the biggest reason for the standardization trend.

Drive Trains Changed Little

While parts integration so far seems slated mostly for body components and accessories, it eventually will hit drive trains too. Meanwhile, there's little engine activity

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scheduled for next year or for 1960. Transmissions also are in limbo.

Buick still is undecided about keeping its triple-turbine Flight Pitch transmission, returning to Dynaflow or using both units as it does now. Ford Division is costing out an inexpensive two-stage automatic shift, but the story is it will be shelved.

GM's Detroit Transmission Division has put out initial tooling orders for its Trans-Axle. Some think this job is scheduled for '59, but reliable sources say it won't come until 1961. The Trans-Axle means transmissions go to the rear. Last week, STEEL pointed out (Page 67) the transmission line-up for 1960.

Brakes—When stylists demanded 14-in. wheels to reduce car heights another fraction of an inch, engineers shook their heads. Smaller wheels and drums just don't provide enough braking surface with today's liners. Systems which would work are far too costly. Heavy cars like Cadillac and Lincoln stayed with 15-in. wheels. Now the engineers are having their day.

Buick, for example, had considered 14-in. wheels for 1959. Oldsmobile went to them this year. Next fall, both lines will appear with 15-in. wheels and low profile tires. In addition, Buick, will be using a chemical bonding process to fasten brake drums to its aluminum wheel. The mechanical method used now hasn't worked out.

Tires—Chrysler Corp. introduced Goodyear's Captive Air tires on some Dodges this year. Despite hard riding qualities and case cracking in early production runs, the Captive Air jobs are slated to appear on at least two more car lines in 1959. Eliminating the spare tire (which Captive Air does) is one of the simplest ways Detroit has found to squeeze more trunk space out of the longer, lower silhouettes.

Air Springs Inflate Slowly

Air suspension systems, introduced this year, are moving slowly. Oldsmobile and Buick Divisions reportedly are turning out less than 50 a day. That's way under the 25 per cent of total production predicted by Edward Ragsdale, Buick's general manager.

Cost is the big item against air springs this year. The extra weight of compressor and air tanks is another disadvantage. This can be licked as designers cut down on weight in other components.

Service stations are complaining about the air bags too. They claim new hoists and equipment are needed for air sprung autos. Automatic leveling devices turn even a tire change into a complicated job.

Scrapped—But GM's air suspension system does work and sales will grow when car buyers have more money to spend. Apparently, Edsel isn't so lucky. Although Ford says nothing, Detroit talk has it that Edsel soon will stop offering the device.

Chrysler, meanwhile, is considering air springs for the rear and torsion bars for the front of its '59 cars. Big hope is that the system will be standard—not optional.

Competition—To keep air suspension engineers on their toes, several spring companies have developed mechanical leveling systems for leaf and coil springs. Elsewhere, Ford and American Motors Corp. are studying a ball joint suspension system where the balls are coated with polyvinyl to cut down wear.

Light Metals Loom Large

What do these changes mean to metalmakers? Aluminum companies say next year's cars will be lighter because they'll contain more aluminum. Cold extruded aluminum will be used on three more grilles; one of them is switching from carbon steel.

Chevrolet, for example, plans to use aluminum trim around doors and windows instead of stainless. Two other lines aren't waiting that long. They're making running changes to aluminum side trim this month and next.

One Alloy—There's also talk of a single aluminum alloy for all automotive use. Chrysler already is close to it. The corporation uses SAE 380 for most parts although specifications still call for 2414, 2410-D, and 3012.

Chevrolet uses 360 aluminum and adds some magnesium to produce F-132 for pistons. If impact extrusions gain favor in Detroit, the auto industry may do away with a separate alloy for pistons.

U. S. Auto Output

Passenger Only

	1958	1957
January	487,700†	642,089
February	.....	571,098
March	.....	578,826
April	.....	549,239
May	.....	531,365
June	.....	500,271
July	.....	495,629
August	.....	524,354
September	.....	284,265
October	.....	327,362
November	.....	578,601
December	.....	534,716
Total	.....	6,107,815

Week Ended	1958	1957
Jan. 4	76,653	91,130
Jan. 11	120,140	147,129
Jan. 18	109,761	145,761
Jan. 25	107,495	145,191
Feb. 1	103,764†	140,411
Feb. 8	102,000*	147,163

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

More Plastics on the Way

Charles A. Chayne, GM's vice president in charge of engineering, says more plastics will be designed into future automobiles. It may be that color baked plastics will prove cheaper than aluminum and stainless for interior trim.

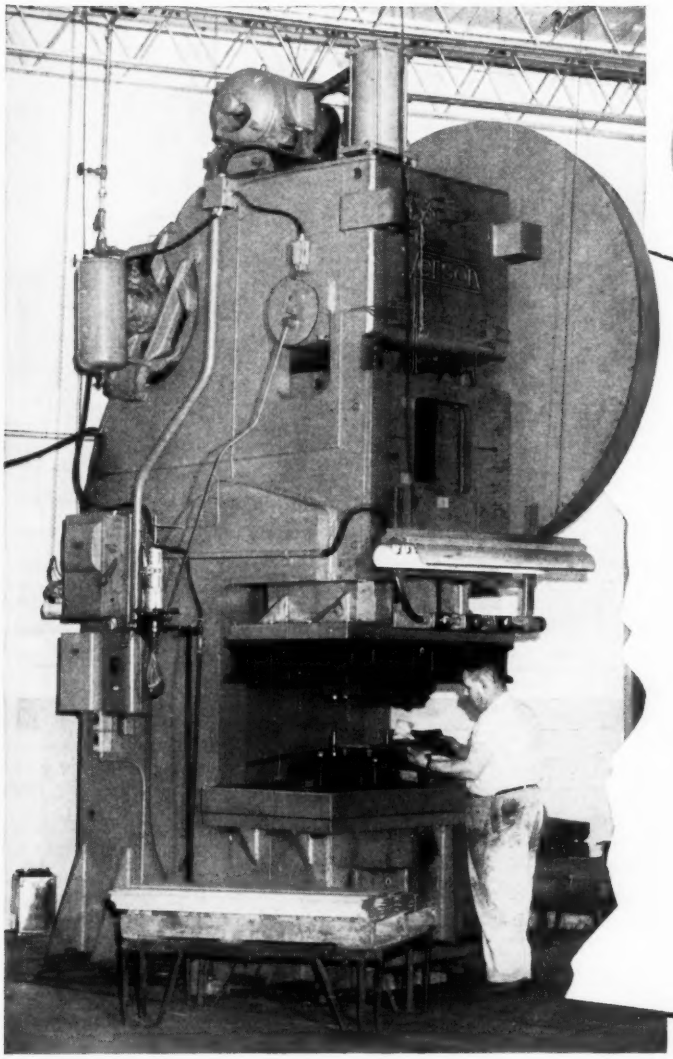
"The net weight average in a standard 1957 four-door sedan is 15.4 lb of plastics," says Mr. Chayne. That doesn't sound like much, but it's a 40 per cent increase over the amount used in the average '55 auto. Next year, the average car is expected to use about 18 lb of plastics. Most of it would show up as interior trim.

In line with these developments, Ford Motor Co. reportedly has bought a small plastics company in Mt. Clemens, Mich., and will integrate it into Highland Park (Mich.) manufacturing operations.

'59s May Bow Late

That's the picture as Detroit starts into its '59 buildups. Hanging over everything is the threat of a UAW strike come July. Tooling deadlines have been set for June.

Even with the early deadlines, it looks like a strike could shove back 1959 model introductions several weeks later than usual.



A Verson Press user reports on versatility:

"...it would be an almost impossible task to list all of the usages to which our

Verson Gap Press

is being subjected"

General Manager
John Blue Company, Inc.

We at Verson often talk of the versatility of our presses and the advantages they offer anyone engaged in the press forming of metals. This is more than just talk . . . it is an established fact, attested to by a host of satisfied customers.

The above excerpt is from a letter recently received from Mr. W. D. Tucker, General Manager of John Blue Company, Inc., Huntsville, Alabama, a leading manufacturer of farm equipment. Mr. Tucker goes on to say that since the Verson Gap Press is the largest in the plant, it is put into service on practically every application including drawing and forming steel shapes, multiple forming, punching and shearing operations.

The machine is a Verson 10-F Gap Press of 250 ton capacity. It has a 10″ stroke with a 5″ power adjustment and operates at 30 strokes per minute. Area of the flanged slide is 34″ x 52″ . . . the area of the bolster, 36″ x 62″. The press requires floor space of 135″ x 73″, is 186″ high and weighs approximately 64,000 pounds.

If you'd like further proof of Verson versatility, talk to other Verson Press users. You'll come away realizing that here is more than just a press . . . here is a production process, engineered and built to provide greater efficiency and production . . . higher profit potential. Put Verson's know-how to work for you. Send an outline of your needs.

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A Verson Press for every job from 60 tons up.

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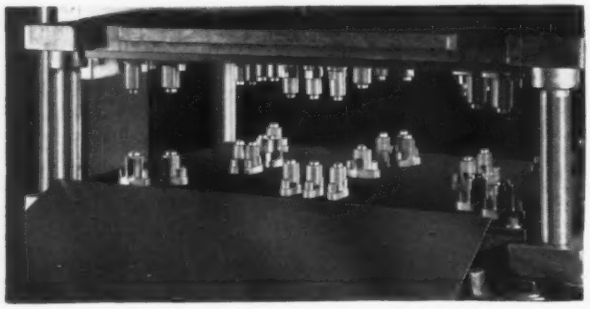
keeps presses working, not waiting!

Nothing to mount on the ram, nothing to align or adjust — just place your Strippit setup in the press and start the run.

That's how Strippit versatility pays off. Any good bench man can mount these independent self-contained punching and notching units in any template pattern within press capacity. New Strippit setups can be kept ready for the press, virtually eliminating down-time.

For flatwork, extrusions, structurals from the smallest gauge to 3/4" mild steel, Strippit gives you these extra advantages:

• The effect of quick-change dies without die-making or die-spotting • Speed over drilling — plus no deburring • Units re-usable over and over • Readily removable punches and dies • Ease, accuracy of template mounting — pilot pin centered on punch • Each unit complete — permanently aligned, fully guided, self-stripping.



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One of a complete line of Strippit vertical and horizontal hole punching units in capacities from the lightest material to ¾" mild steel. Wide choice of die heights, shut heights and throat depths.

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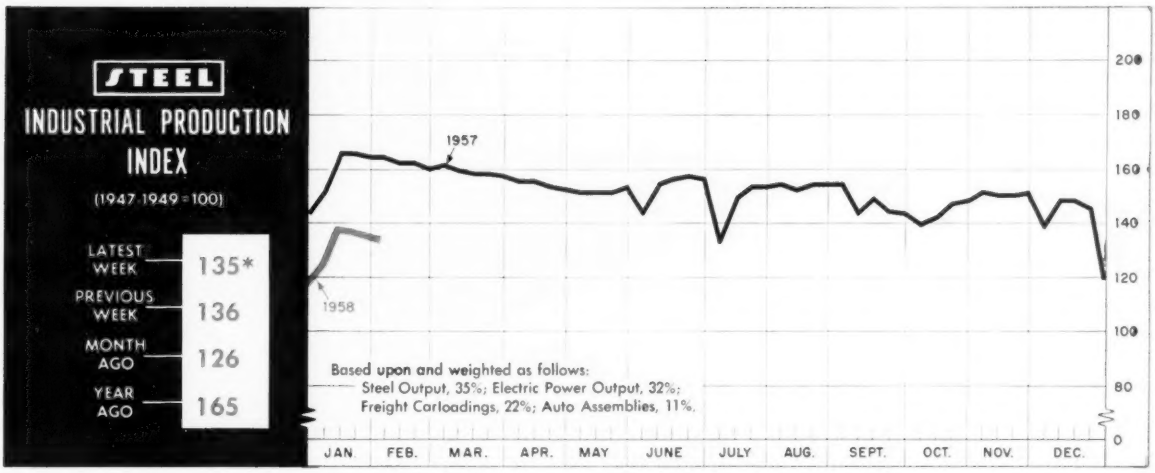

*Week ended Feb. 1.

Downtrend To Continue Through February

OUR ECONOMY is in the midst of the most sluggish February in four years, following the worst January in the same period. March promises to be a little better, but not enough to lift the first quarter above mediocrity at best.

STEEL's industrial production index (above) shows the downtrend since the mild postholiday recovery, and there is nothing in the crystal ball to cause much optimism for the rest of the month. All four elements of the index are behind the year-ago performances. Even production of electric energy continues to ride a hair's width below the 1957 level.

What's in Store—Edison Electric Institute's figures show that output of electric energy during the week ended Jan. 25 was 12.399 billion kw-hr, 0.1 per cent under the total of the corresponding week last year. This was the second straight week to show a year-to-year deficit, and it probably will not be the last. The big weakness comes in the heavily industrialized areas, and there is no sign that the condition will change before March at the earliest.

Past performance indicates that electric output will show a seasonal drop of close to 500 million kw-hr between now and spring. This will mean a loss of about 3 points to the production index.

The steel industry continued to slip during the week ended Feb. 9, producing only an estimated 1,479,000 tons, the American Iron & Steel Institute reports. This was the lowest level since the Christmas week. Many industry spokesmen expect February to be the low month in this downtrend, with only slight recovery in March. This means that this segment of the index will lose another point—maybe two—within the next few weeks.

Auto Optimism — Motordom's planners have been scaling down their projections since late last year, and February will probably follow the pattern. As the month opened,

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,454[1]	1,459	2,485
Electric Power Distributed (million kw-hr)	12,300[1]	12,399	12,322
Bituminous Coal Output (1000 tons)	8,300[1]	8,440	10,170
Crude Oil Production (daily avg—1000 bbl)	6,900[1]	6,923	7,422
Construction Volume (*ENR*—millions)	$389.7	$218.9	$406.8
Auto, Truck Output, U. S., Canada (*Ward's*)	129,710[1]	131,969	172,923
TRADE			
Freight Carloadings (1000 cars)	545[1]	551	648
Business Failures (Dun & Bradstreet)	333	260	258
Currency in Circulation (millions)[3]	$30,625	$30,878	$30,607
Dept. Store Sales (changes from year ago)[3]	−3%	+1%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,509	$23,464	$22,614
Federal Gross Debt (billions)	$275.0	$274.7	$276.5
Bond Volume, NYSE (millions)	$25.7	$33.1	$20.0
Stocks Sales, NYSE (thousands of shares)	10,754	11,621	9,048
Loans and Investments (billions)[4]	$86.5	$87.0	$85.6
U. S. Govt. Obligations Held (billions)[4]	$25.9	$25.9	$26.3
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.92
STEEL's Nonferrous Metal Price Index[6]	201.1	200.7	246.8
All Commodities[7]	118.8	118.8	116.9
Commodities Other than Farm & Foods[7]	125.9	125.9	125.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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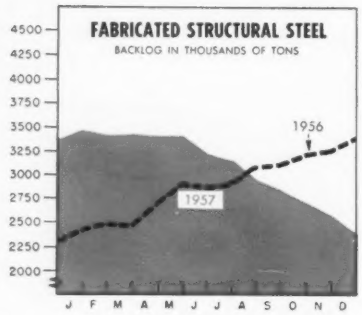
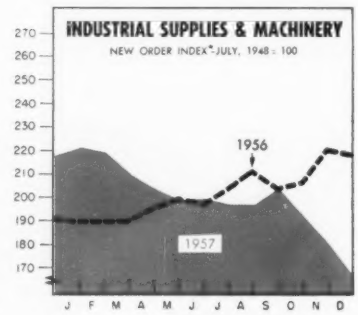
THE BUSINESS TREND





	Shipments 1957	Shipments 1956	Backlogs 1957	Backlogs 1956
Jan.	262.2	251.5	3,476	2,408
Feb.	278.5	285.4	3,436	2,476
Mar.	305.0	306.8	3,454	2,463
Apr.	313.6	289.6	3,416	2,687
May	329.6	306.2	3,417	2,896
June	329.3	284.7	3,220	2,859
July	303.5	165.5	3,138	2,904
Aug.	333.1	213.5	2,962	3,076
Sept.	294.7	240.9	2,846	3,108
Oct.	331.0	287.6	2,683	3,215
Nov.	293.4	276.0	2,564	3,252
Dec.	278.2	297.8	2,395	3,373
Totals	3,652.0	3,205.5		

American Institute of Steel Construction.
Charts copyright, 1958, STEEL.

	1957	1956	1955
Jan.	221	190	160
Feb.	219	190	166
Mar.	210	190	171
Apr.	203	195	172
May	199	199	177
June	199	197	189
July	197	203	182
Aug.	197	211	186
Sept.	203	203	196
Oct.	192	206	185
Nov.	180	220	194
Dec.	167	218	191

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.

officials scheduled 445,200 units, says *Ward's Automotive Reports*. That would indicate a slight pickup from the rate of the last four weeks, but don't bet on it. At the beginning of January, 523,000 passenger cars were slated to roll off the assembly lines during the month. The final count was close to 487,700 passenger cars, according to *Ward's*.

In addition, truckmakers are cutting back their schedules by about 10 per cent.

Conclusion: This segment of the index will do well to hold its own this month.

Probably the most depressed of the indicators is and will continue to be the railroad industry. Carloadings have trailed the year-ago pace for 25 straight weeks, and there is no hope that this string will be broken in the near future. The deficit for the year to date is 15.6 per cent below the corresponding 1957 period. The Association of American Railroads had predicted a decline of only 3.8 per cent during the first quarter.

This industry normally is at its lowest level during this season of the year. So no strength can be expected from it until the iron ore season opens in the spring.

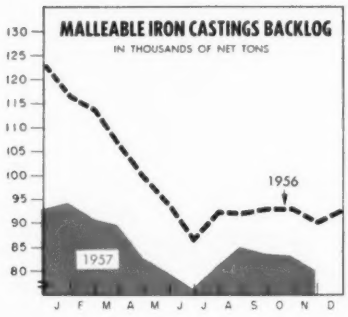
More Downtrend—The only conclusion that can be drawn is that the industrial production index is in for rough sledding this winter. It will not be surprising if it descends another 5 or 6 points to a low of 129 or 130 before it firms up in the spring.

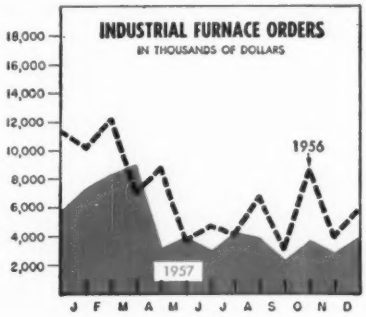
Worst of Dip Is Over

The greatest portion of the recession is behind us. That is the impression that one gets from the numerous industry reports which are now coming in for November and December. The break in the fourth quarter was so severe that any sizable continuation of it would make business conditions far more serious than most observers are inclined to think they are.

One of the biggest drops occurred in the fabricated structural steel industry. Bookings were down almost 60,000 tons in December, bringing a reduction in shipments for the second straight month. For the first time since last March, shipments fell behind the year-ago pace. Backlogs continued the decline that has been uninterrupted since midyear (see chart, above).

Billings for heat treatings in December fell 14.5 per cent below the





	Shipments 1957	Shipments 1956	Unfilled Orders* 1957	Unfilled Orders* 1956
Jan.	86.0	93.6	93.9	116.5
Feb.	78.0	93.6	90.7	113.6
Mar.	78.0	86.9	89.4	106.5
Apr.	80.3	83.3	83.1	99.6
May	76.5	78.8	79.8	93.7
June	72.6	75.6	76.3	86.2
July	57.7	54.3	80.7	92.1
Aug.	65.4	74.4	84.9	91.9
Sept.	62.5	69.4	83.4	92.6
Oct.	77.7	81.5	83.0	92.7
Nov.	67.9	82.7	80.1	90.0
Dec.	...	76.4	...	92.3
Total	...	950.5		

*For Sale. U. S. Bureau of the Census.

	1957	1956	1955
Jan.	7,380	10,244	4,973
Feb.	8,373	12,163	5,616
Mar.	9,090	7,025	7,345
Apr.	3,164	8,803	7,539
May	3,994	3,667	6,205
June	2,974	4,748	5,812
July	4,332	4,140	4,338
Aug.	3,924	6,722	6,273
Sept.	2,337	3,057	8,351
Oct.	3,621	8,741	9,575
Nov.	2,832	3,986	6,180
Dec.	3,992	5,858	11,105

*Not including new orders for steel mill furnaces.
Industrial Heating Equipment Assn. Inc.

year-ago figure, reports the Metal Treating Institute. Because of a strong start, the year as a whole showed only a 2.8 deficit, compared with 1956.

The sales index of the American Gear Manufacturers Association hit 150.8 (1947-49 = 100) in December, the lowest level since February, 1955. The yearly average of 216.5 compares with 254.4 in 1956 and 198.3 in 1955.

Industrial suppliers saw their December new orders slide for the third consecutive month, hitting a 33-month low of 167 (1947-49 = 100). The year as a whole still compares favorably with 1956 (see chart, Page 62).

At no time last year did the foundries come up to expectations, and the situation was worse in the fourth quarter. During November, the latest month for which statistics are available, shipments of both steel and gray iron founders hit the year's low point.

The least affected group was the malleable founders (see chart and table above), probably because of fair business from the auto companies which were building up new model production at that time.

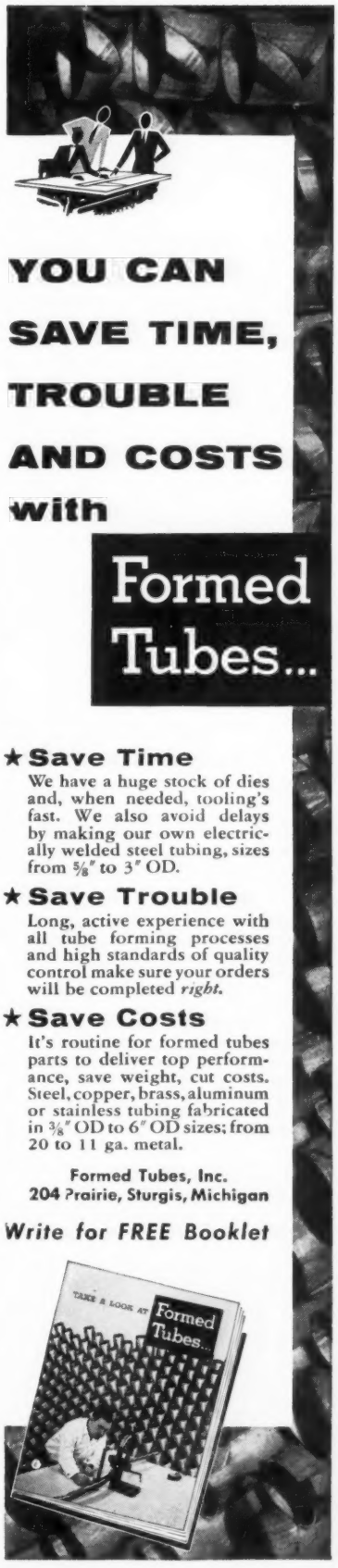
An exception to the rule was the electric appliance industry, which began its decline late in 1956. By last November, it seemed to be picking up strength. It produced more refrigerators, freezers, ranges, water heaters, dishwashers, and waste disposers that month than in the year-ago period.

Sees Good Replacements

More evidence of the slump in capital goods sales is the report of the Machinery Dealers National Association. Sales of used equipment in December amounted to only 87.7 per cent of the 1947-49 average.

Frederick V. Geier, president, Cincinnati Milling Machine Co., does not expect demand for new equipment to come from expansion pressures, but he feels that the replacement market will help. "Over 60 per cent of all machine tools in use in America today can be classed as below present-day standards. . ."

Mr. Geier thinks the following areas offer sales potentials this year: Efficiency and cost-cutting analyses; technical advances by both producers and users of machine tools; greater need for transfer-type lines and automation equipment; greater requirements of the national defense effort.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Wickes div. president

THOMAS H. BRUMAGIN
Ajax Flexible sales post

GEORGE L. HEMMERLY
Mathews Conveyer p. a.

FREDERICK W. BURGIE
Doehler-Jarvis sales post

George A. Kendall, chief engineer, machine tool division, **Wickes Corp.,** at Saginaw, Mich., was appointed division president and general manager. He succeeds **Carl Bintz,** retired.

Thomas H. Brumagin was made general sales manager, **Ajax Flexible Coupling Co. Inc.,** Westfield, N. Y.

Harry T. Marks, executive vice president, was elected president of **Ferro Corp.,** Cleveland, succeeding the late **C. D. Clawson.**

Louis J. Wiegand was made assistant sales manager, **Sidney Machine Tool Co.,** Sidney, Ohio.

A. E. Reinhard was elected vice president, **Detroit Steel Corp.,** in charge of its basic steelmaking plant at Portsmouth, Ohio. He was general manager at Portsmouth.

Frederick G. Syburg, director of purchases, was elected vice president-purchasing, **Chain Belt Co.,** Milwaukee. **George A. Evans** was elected secretary to succeed **W. C. Messinger,** recently made vice president.

William B. Firman was made marketing manager of **Orr & Sembower Inc.,** Reading, Pa. He was manager of domestic Powermaster sales.

Neil E. Firestone was appointed general manager of **General Electric Co.'s** production engine department, with headquarters in Evendale, Ohio. He was manager of manufacturing operations service in New York.

George L. Hemmerly was appointed purchasing agent, **Mathews Conveyer Co.,** Ellwood City, Pa. He replaces **Chesley A. Paul,** retired. Mr. Hemmerly was assistant purchasing agent.

Lloyd L. Black was elected vice president-manufacturing, **Line Material Industries,** Milwaukee, succeeding **J. M. Van Vleet.** Mr. Black was plant manager at the Zanesville, Ohio, transformer plant.

Joseph T. Ryerson & Son Inc., Chicago, appointed **Herbert G. Dent** engineering consultant to the vice president-operations. He is succeeded as director of plant engineering by **Stanley J. Miller,** former assistant director.

Edward E. Kirkham was named chief development engineer and head of the experimental department, machinery division, **Pratt & Whitney Co. Inc.,** West Hartford, Conn.

Dan D. Williams was appointed assistant general sales manager; **Curt K. Wiley,** Pittsburgh district sales manager, refractories division, **H. K. Porter Company Inc.** Mr. Williams was formerly with E. J. Lavino & Co. Mr. Wiley was president of Gem Clay Forming Co.

Joseph E. Mulheim was named director of aircraft products engineering and manufacturing, **Leland Electric Co.,** Dayton, Ohio, division of American Machine & Foundry Co. **Hayes Crapo** succeeds Mr. Mulheim as chief engineer of aircraft products.

Frederick W. Burgie was appointed general sales manager, **Doehler-Jarvis Div.,** National Lead Co., Toledo, Ohio. Formerly assistant general sales manager, he succeeds **E. R. Zabriskie,** who is on special assignment assisting the division's general manager.

Armco Steel Corp., Middletown, Ohio, elected **W. C. Higdon** vice president-planning and development, succeeding **F. H. Fanning** who is retiring; **T. F. Olt,** formerly director of research, vice president-research; and **W. F. Tuttle,** director of engineering. Succeeding Mr. Higdon as manager of the Houston plant of the Sheffield Div. is **K. P. Campbell,** plant general superintendent-operations. **J. B. Whitlock,** general maintenance engineer, replaces Mr. Tuttle as chief engineer of the Armco Div.

William G. Fallon was elected a vice president, **Norton Co.,** Worcester, Mass. He continues as general manager, refractories division.

John E. Jacobs succeeds **Edmund F. Martin** as general manager of **Bethlehem Steel Co.'s** Lackawanna, N. Y., plant.

Peter Kuntz was appointed industrial x-ray technician for the eastern region, **Gevaert Co. of America Inc.** He is in New York.

Worcester Pressed Steel Co., Worcester, Mass., appointed **Folke A. Erickson** stampings sales manager; **O. Eric Peterson,** sales manager, Mutual Products Co. Inc., newly acquired subsidiary; **David B.**

J. HOWARD STOOPS

E. A. MILLHEAM

Huppower Div. promotions

ROBERT H. DAISLEY

WILLIAM A. MATTIE

Eaton Mfg. executive staff changes

Stowe, engineering manager, Hi-Pac Div.

J. Howard Stoops fills the new post of general sales manager, **Huppower Div.**, Hupp Corp., Detroit. He is succeeded by **E. A. Millheam** as manufacturing manager of the division. Mr. Millheam was general manager of HaDees Heater Div., which Huppower recently purchased from Gabriel Co.

William M. Hankins Jr. was elected president, **Bunting Brass & Bronze Co.**, Toledo, Ohio. He succeeds **George H. Adams**, retired.

Crucible Steel Co. of America appointed **Harry W. McKee** assistant branch manager-staff; **Edgar C. Knop**, assistant branch manager-field, Chicago sales branch.

Bruce Mayo was made Birmingham district manager, **Link-Belt Co.**, replacing **J. Ross Arnold**, who was appointed to handle a special assignment at the Colmar, Pa., plant.

Karl H. Walles was appointed sales manager, **Caldwell Co. Inc.**, Rockford, Ill. He was Chicago district manager, wire rope division, John A. Roebling's Sons Corp.

George C. Sargeant was made director of research and development by **Sargeant & Wilbur Heat Treating Corp.**, Pawtucket, R. I. Prior to retirement in 1954, he was president of Sargeant & Wilbur Inc.

Richard P. Fierst was elected assistant treasurer, **Copperweld Steel Co.**, Pittsburgh. He was treasurer of Superior Steel Corp., recently merged as a Copperweld division.

Eaton Mfg. Co., Cleveland, elected **Robert H. Daisley** to the new post of vice president-planning. **William A. Mattie**, general manager of the heater division, was elected vice president-administrative, succeeding Mr. Daisley.

Guy H. Pitts was elected vice president-manufacturing, **Bohn Aluminum & Brass Corp.**, Detroit. He was manager of the fabrication division.

B. E. Meyer was named manager of can machinery sales of **E. W. Bliss Co.**, Canton, Ohio, replacing **Roland H. Johnson.** Mr. Meyer was chief sales engineer of the can machinery division.

Walter L. Flinn was appointed staff director of defense activities for **Vickers Inc.**, Detroit. He is in Washington, where he has served as manager of the Aero Hydraulics Div. office.

Joseph J. Drexler was elected a vice president, **Edgcomb Steel Co.**, Philadelphia. He has been general manager of the Edgcomb York Warehouse, York, Pa.

William Buhl was made manager of commercial sales for **Chromalloy Corp.**, White Plains, N. Y. He was with United Aircraft Products Inc.

Charles S. Hamilton Jr. was elected vice president and treasurer, **Russell, Burdsall & Ward Bolt & Nut Co.**, Port Chester, N. Y. He replaces **John B. Gates**, resigned.

Martin T. Zegel was appointed product planning manager, special products division, **Stromberg-Carlson**, Rochester, N. Y., a division of General Dynamics Corp. **William E. Cutler** succeeds Mr. Zegel as sales manager-commercial products.

John L. Adank was named president; **Fred C. Heppel**, executive vice president of the newly formed **NCG Div.**, National Cylinder Gas Co., Chicago. Mr. Adank was vice president-sales, northern division, for the company. Mr. Heppel was in charge of southern operations.

Eugene Lepkowski was appointed controller of **Square D Co.'s** newly formed assembly division. He is in the Detroit offices.

Erle T. Plummer was named general sales manager of **Union Asbestos & Rubber Co.'s** fibrous products division, Chicago.

W. O. Brown was made general manager of sales, **Crane Co.**, Chicago. He was district sales manager for the West Coast at Los Angeles.

Samuel Salem was elected vice president-general manager; **A. S. Chalfant**, vice president-sales at **A. M. Byers Co.**, Pittsburgh. Mr. Salem was vice president-sales and manufacturing. Mr. Chalfant was general sales manager.

Robert J. Hostetter was appointed sales manager, **Koehler Aircraft Products Co.**, Dayton, Ohio, subsidiary of New Britain Machine Co. He was formerly sales manager of National Water Lift Co., division of Cleveland Pneumatic Tool Co.

General Electric Co. appointed **Lewis J. Burger** general manager, gas turbine department, Schenectady, N. Y.; **John P. Keller**, general

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like coffee soaks into a sugar cube!

How much do you spend on removing rust before you paint? Why not coat right over the sound rusted metal with Rust-Oleum 769 Damp-Proof Red Primer after simple scraping and wire-brushing to remove rust scale and loose rust . . . saving time, money, and metal! Rust-Oleum's specially-processed fish oil vehicle penetrates* through rust to bare metal—while the surface film remains *tough, firm,* and *durable.* You cut costly surface preparations, you receive nearly 30% greater coverage depending upon the condition and porosity of the surface—and you receive the *maximum* in over-the-years protection!

Whatever your color choice may be—Rust-Oleum finish coatings include the color you want. They're manufactured under the same *exclusive* formulation as the Rust-Oleum Primer . . . they assure you of *greater* compatibility, *double* protection, and *lasting* beauty! The best way to see what Rust-Oleum will do for you is to actually try it yourself . . . around your plant or home.

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*As proved by Battelle Memorial Institute Technologists in radioactive tracing studies.

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JAMES E. DUFF
joins Joy Mfg.

STEVEN S. GORDON
Republic Gear v. p.

JOHN MICHELOTTI
Clearing Machine operations

JOHN W. ELBIN
Porter div. works mgr.

manager, small steam turbine department, Fitchburg, Mass.

James E. Duff joined **Joy Mfg. Co.** as general sales manager, electrical products division, at St. Louis. Previous associations were with Ingersoll Rand Co. and Cuno Engineering Corp.

Steven S. Gordon was appointed vice president and general manager, **Republic Gear Co.**, Detroit, subsidiary of Gear Grinding Machine Co. He was director of sales.

William D. Kohlins was made general manager, **Buflovak Equipment Div.**, Blaw-Knox Co., Buffalo. He was plant manager.

James I. Julian was appointed vice president of the newly formed **Solar-Chicago Co.**, division of U. S. Industries Inc., Chicago. He is in charge of production, engineering, and service for the company's two subsidiaries, Solar Permanent Co. and Chicago Steel Tank Co.

Dr. Joseph V. Petrocelli was appointed head of the electrochemical section of **International Nickel Co.'s** research laboratory at Bayonne, N. J.

Glen Boyd was appointed regional sales manager for the new Dixie regional office of **Brainard Steel Div.**, Sharon Steel Corp. He is at Dallas.

E. A. Quinlan was made assistant sales manager at Minneapolis for **Air Reduction Sales Co.**

Paul Putnam was elected president of **AP Parts Corp.**, Toledo, Ohio, succeeding **Ralph G. Rule.**

John Michelotti was appointed director of operations, **Clearing Machine Corp.**, division of U. S. Industries Inc., Chicago. He is responsible for manufacturing, production, engineering, and purchasing.

C. E. Penske and **Fred C. White** were elected vice presidents, **Meilnik Steel Safe Co.**, Toledo, Ohio. Mr. Penske is general sales manager. Mr. White is general plant manager.

Anaconda Wire & Cable Co., New York, named **Bruce Van Wagner** marketing manager; **William Olsen**, manager of building wire sales; **Robert McIlvane**, manager, communication cable sales; **Thomas Jackson**, assistant manager, industrial sales; **Anthony L. Spina**, assistant sales promotion manager.

Edwin W. Schenck was elected secretary-treasurer, **Grede Foundries Inc.**, Milwaukee, to succeed **Ralph L. Lee**, retired.

Dr. Fred P. Adler was appointed manager, advanced planning staff, for the systems development laboratories of **Hughes Aircraft Co.**, Culver City, Calif.

Vincent I. Rhodes was appointed assistant superintendent of the shops department, **Youngstown Sheet & Tube Co.**, Youngstown.

George T. Humphrey Jr. was made general manager, service-sales division, **Timken Roller Bearing Co.**, Canton, Ohio. He replaces **E. H. Austin**, now special representative working with the director of sales and the vice president-sales.

John W. Elbin was appointed general works manager, Cleveland Forge Works and Cleveland Die Cast Works of **H. K. Porter Company Inc.'s** forge and fittings division. The Cleveland operation was recently acquired from Cleveland Hardware & Forging Co. Mr. Elbin was formerly general manager of General Drop Forge Corp., Buffalo, subsidiary of Dana Corp.

J. J. Durkin was named Seattle district manager for **Automatic Sprinkler Corp. of America.**

Robert Holming was elected president of **Holming Co.**, Milwaukee.

D. W. Heck was promoted to assistant to the works manager, Brackenridge, Pa., Works, **Allegheny Ludlum Steel Corp.** He is succeeded as superintendent of the No. 2 finishing department by **J. W. Bottorf.**

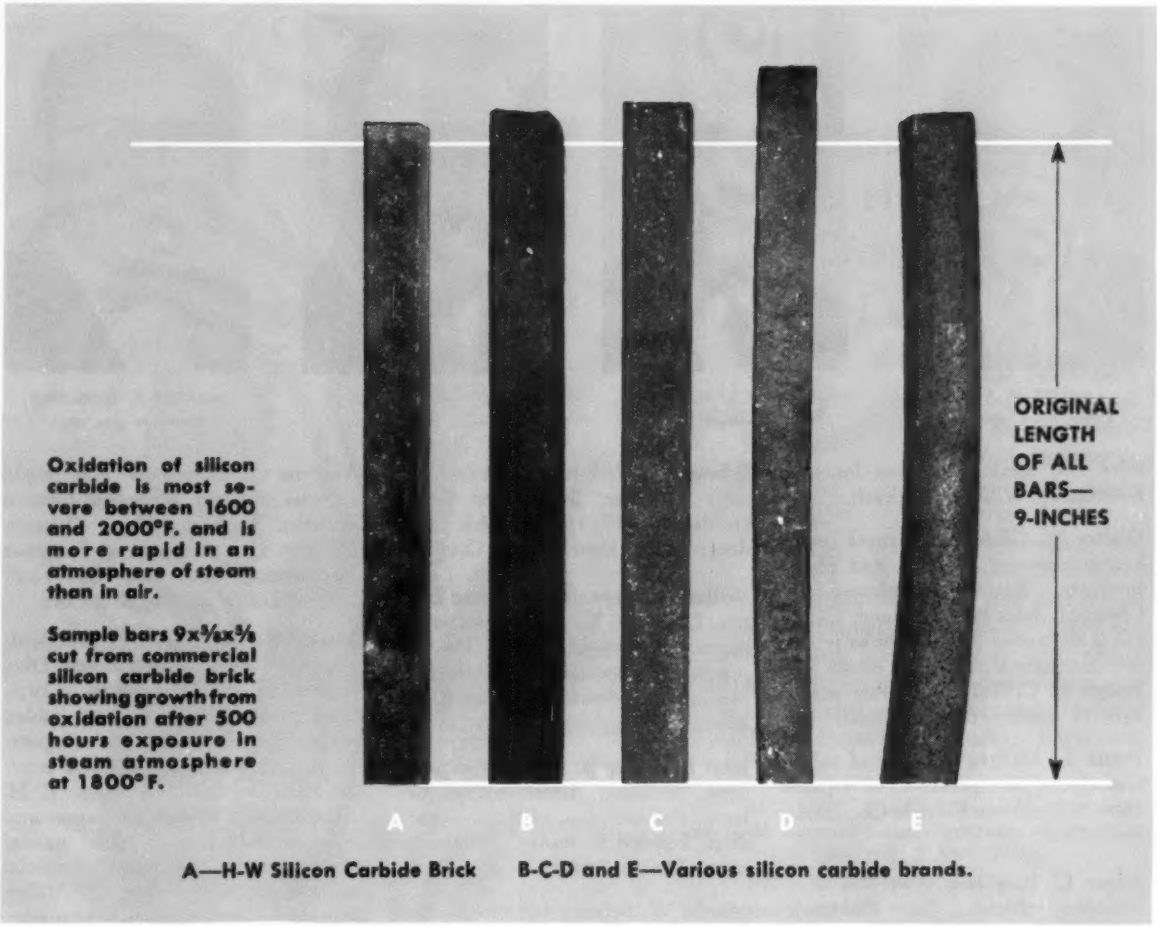
Edmund C. Austin fills the new post of director of purchases for **Fluor Corp. Ltd.**, Los Angeles.

Herbert E. Elliot joined **Loewy-Hydropress Div.**, Baldwin-Lima-Hamilton Corp., New York. He was manager of hydraulic sales at Watson-Stillman Div., Farrel-Birmingham Corp.

W. F. Eagan was made chief engineer, control department, **Allis-Chalmers Mfg. Co.**, Milwaukee.

Frank Domenick Jr. was appointed senior cost analyst at **Universal-Cyclops Steel Corp.**, Bridgeville, Pa.

Wallace E. Swan was made sales manager, machinery division, **Racine Hydraulics & Machinery Inc.**, Racine, Wis. He is succeeded as


Oxidation of silicon carbide is most severe between 1600 and 2000°F. and is more rapid in an atmosphere of steam than in air.
Sample bars 9x⅝x⅝ cut from commercial silicon carbide brick showing growth from oxidation after 500 hours exposure in steam atmosphere at 1800° F.
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A
B
C
D
E
A—H-W Silicon Carbide Brick
B-C-D and E—Various silicon carbide brands.

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High temperature firing in a closely controlled atmosphere contributes to the formation of an exceedingly impervious surface and lower permeability. These properties improve resistance to the objectionable oxidation which always is accompanied by volume increase and loss in strength.

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AND SUBSIDIARIES
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WALTER M. GIBBS
Kaiser Alum. marketing

FRANK L. MATHES
Arrow-Hart v. p.

EDWARD G. MERK
joins Burgmaster

VINCENT R. TROGLIONE
Sunbeam gen. mgr.

sales and service engineer for the division by **William McIlrath.**

Walter M. Gibbs was named marketing manager of sheet and plate products, **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. He is succeeded at Chicago as product manager-sheets and plates by **Joseph E. Griffith Jr.**, former manager of sheet order allotment.

Frank L. Mathes, director of sales, was elected vice president of **Arrow-Hart & Hegeman Electric Co.**, Hartford, Conn.

Edgar C. Rice was appointed vice president, **Noble Co.**, Oakland, Calif., and manager of its automation division. He was manager of the crane division.

Joseph M. Beck was made purchasing agent of **Thrall Car Mfg. Co.**, Chicago Heights, Ill.

E. J. van Dyk was appointed general manager of **Control Devices Inc.**, Warren, Mich.

Edward G. Merk was made national sales manager, **Burgmaster Corp.**, Gardena, Calif. He was vice president-sales at Benchmaster Corp.

William E. Bryan joined **Acme Electric**, Cuba, N. Y., as sales manager, custom equipment section. He was previously associated with American Machine & Metals Inc., and Rapid Electric Co.

John F. Straitz Jr. was elected president, **National Airoil Burner Co. Inc.**, Philadelphia. Former president, **Edward P. Bailey**, remains as counsel to the firm.

Martin W. Schultz was elected vice president-manufacturing; **Albert M. Thomas**, administrative vice president, **Pusey & Jones Corp.**, Wilmington, Del.

Maj. Gen. Albert Boyd was elected vice president of **Westinghouse Electric Corp.**, Pittsburgh, and general manager, defense products divisions. General Boyd retired last October from the U. S. Air Force.

Vincent R. Troglione was made general manager, industrial furnace division, **Sunbeam Corp.**, Chicago. He was vice president of Ferguson Equipment Corp., and chief engineer of Loftus Engineering Corp.

Harold R. Sennstrom, vice president-engineering, **American Bosch Div.**, American Bosch Arma Corp., Springfield, Mass., assumes added duties for all division sales operations, and was appointed vice president-engineering and sales. **J. H. Flaskamper**, former manager and vice president-sales, was named staff assistant (in charge of special assignments) to **Sidney E. Miller**, vice president-division manager. **Bert Cole**, director of marketing and distribution, commercial products, for American Bosch Arma, will also serve temporarily as acting general sales manager of the division.

Gordon E. Mott was elected controller of **Dresser Mfg. Div.**, Dresser Industries Inc., Bradford, Pa. He succeeds **Milton H. Nelson**, elected treasurer.

OBITUARIES...

Thomas P. Butler, 68, chairman, **Heyl & Patterson Inc.**, Pittsburgh, died Jan. 29.

David J. Giles, 67, senior vice president, **Latrobe Steel Co.**, Latrobe, Pa., died Jan. 5.

Alvin Gibson, 66, sales co-ordinator, **Pesco Products Div.**, Cleveland, Borg-Warner Corp., died Jan. 22.

Frank X. Gilg, 57, an executive assistant in the boiler division of **Babcock & Wilcox Co.**, New York, died Jan. 26.

Carlos E. Bronson, 71, former vice president and chief engineer, **Kewanee Boiler Div.**, Kewanee, Ill., American Radiator & Standard Sanitary Corp., died Jan. 21.

Earl S. Sargeant, 69, past president, **Westeel Products Ltd.**, Toronto, Ont., died Jan. 22.

Harold N. Magnan, 52, general sales manager, **Disher Steel Div.**, Dominion Structural Steel Ltd., Toronto, Ont., died Jan. 24.

Edgar F. Jackson, 60, vice president-sales manager, **Ben-Hur Mfg. Co.**, Milwaukee, died Jan. 25.

Daniel J. Kennedy, 42, assistant general manager, **Buffalo Hydraulic Div.**, Houdaille Industries Inc., died Jan. 24 in Buffalo.

Leo H. Schemenauer, 67, founder of **Schemenauer Mfg. Co.**, Holland, Ohio, died Jan. 17.

William J. McIlvane, 62, former executive vice president, wire and cable division, **Copperweld Steel Co.**, Pittsburgh, died Jan. 26.

Otto H. Hofman, 70, vice president-secretary, **General Magnetic Corp.**, Detroit, died Jan. 27.

SIMONDS

gives you the right Blade . . . for every Duel with Costs

Power and hand hacksaw cutting are most efficient . . . and cost less . . . when the blade wears the Simonds "Red End". Here's why:

Accurately milled and precision-set teeth wear evenly, provide straighter cuts and longer blade life. Simonds own cross-rolled steel has more uniform grain structure with added toughness to resist wear and give more cuts per blade. Put these better blades to work for you NOW . . . get better results at lower cost!

LOOK for . . . INSIST on . . . the blade with the "RED END"

SIMONDS

"RED END" POWER BLADES

3 Types — All Standard Lengths and Tooth Spacings

- **HIGH SPEED MOLYBDENUM**
- **HIGH SPEED TUNGSTEN**
- **HIGH SPEED "WELD EDGE"**

(Shatterproof)

For general purpose cutting, Simonds High Speed MOLYBDENUM cuts fast and straight at lowest cost. For cutting high alloys (and maximum performance) Simonds High Speed TUNGSTEN is recommended. For maximum plant safety Simonds "WELD-EDGE" is the choice — won't snap despite abuse and poor machine condition or adjustment. Pick the blade (or blades) you need, but make it *Simonds!*

SIMONDS

"RED END" HAND HACKSAW BLADES

3 Types — Hard Edge or All-Hard
Standard Lengths and Tooth Sizes

- **STANDARD STEEL**
- **HIGH SPEED MOLYBDENUM**
- **HIGH SPEED TUNGSTEN**

Again . . . pick the blade for the job. Hard Edge (blade-body tough and highly strain resistant) is best for general purpose cutting. All-Hard for quality cutting where work is securely held. "Pick your teeth" also for the job — 14 teeth for soft metals; 18 for cutting tool steels, iron pipe, etc.; 24 for drill rod, tubing, etc.; 32 for thin sheet and thin tubing.

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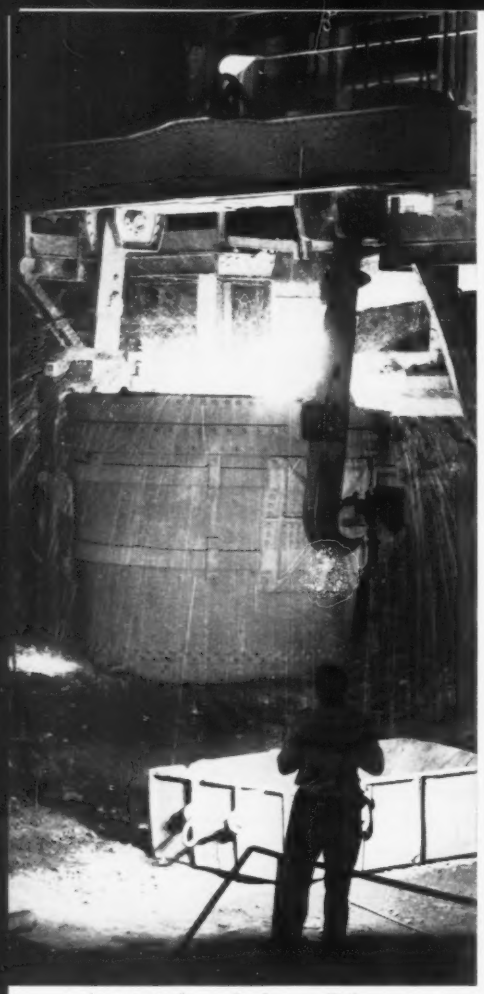

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ALCO's *regular forgings offer many opportunities for cost reduction in machine set-up and tooling.*

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In either regular or Hi-Qua-Led® grades in any AISI specification, or in stainless steel, ALCO circular and open-die forgings offer you unique advantages. They can lower your costs in machine set-up and tooling, because you are able to standardize procedures and set machining speeds for the best overall economy. Yet this extra opportunity for profit is obtained with no additional expense.

ALCO's forged and rolled circular forgings range from 18 to 145 in. OD; open-die forgings from 500 to 30,000 lb and 40 ft in length; mandrelled ring forgings to approximately 60 in. wide.

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J&L Completing $82-Million Project

Installation of roughing mill forces suspension of normal operations at Cleveland Works. Steelmaking facilities and all phases of production line have been improved

JONES & LAUGHLIN Steel Corp., Pittsburgh, has entered the final phase of an $82-million modernization and expansion program at its Cleveland Works which will make it one of the world's major flat-rolled steel facilities. Normal operations are being halted while a new roughing mill is being installed.

"When we get this rougher into operation, our new blooming mill, new cold rolling mill, and other new units will really become integrated parts of a greatly improved and enlarged steel mill," says J. R. Powell, Cleveland Works manager. "With all units operating, our capacity to produce cold-rolled sheets at this plant will be doubled. When the present decline in steel production is ended, this plant will be ready to . . . compete against the finest mills in the country."

Shutdown—About 3200 of the present work force of 3500 will be temporarily affected by the layoffs. The blast furnace department and steelmaking furnaces will be shut down first, followed by suspension of other operations. It will be about four weeks before all production is stopped. About ten weeks will elapse from the start of the shutdown to resumption of normal operations.

New Facilities—Besides enlargement and improvement in steelmaking facilities, the modernization encompasses all production phases. New soaking pits have been added and a powerful blooming mill is ready for operation. A continuous pickling line has been installed, together with an ultramodern 4-stand, tandem cold-reducing mill; new annealing facilities, a temper mill, hot and cold shear lines, and warehouses and shipping areas.

A new sintering plant has been installed at a cost of about $7 million. It has a daily capacity of 2500 tons and replaces a facility which was averaging about one-sixth of the present capacity. As a result of this installation, existing blast furnace capacity at the Cleveland Works will be increased about 300 tons to about 2500 tons of pig iron daily.

Enters Transformer Field

Gulton Industries Inc., Metuchen, N. J., established a department for the development, production, and marketing of special transformers. Initially, production will consist of high voltage, high current, and high temperature transformers. Subsequent production will include all types of audio, power, and pulse transformers. Paul Walshin has been named to head the new department.

Steel Distributor Expands

Great Western Steel Co., Chicago, is expanding and modernizing its warehouse in Milwaukee. The project includes an addition of 12,000 sq ft to the structure and installation of material handling equipment. N. J. Mayer is district manager.

Opens Technical Center

Research & Development Div. of U. S. Industries Inc., New York, opened its laboratory and plant at Pompano Beach, Fla. The new facility, Kett Technical Center Inc., will operate as a subsidiary. Its products are chiefly in the aircraft, missile, and atomic energy fields. Karl Schakel is president of the center.

Inland Building Dedicated

Inland Steel Co.'s glass and stainless steel skyscraper stands shiny and new in the Chicago Loop. The two units, office and service towers, are at Dearborn and Monroe Streets.

The office tower (STEEL, Dec. 24, 1956, p. 64), has 19 floors and is supported entirely by 14 exterior steel columns.

The service tower, connected to the office tower, is a windowless shaft 332 ft high. It contains elevators, fire stairs, washrooms, and automatic mail conveyors.

It is the first major structure using Type 202 (chromium-nickel-manganese) stainless steel. About 400 tons were required.

Revamps Operations

Pratt & Letchworth, a division of Dayton Malleable Iron Co., Dayton, Ohio, is discontinuing the manufacture of miscellaneous commercial steel castings and will confine itself to production of railroad castings. Some 135,000 sq ft of its 450,000 sq ft plant at 189 Tonawanda St., Buffalo, N. Y., will be sold. About $750,000 will be spent during the next two years to modernize facilities for the railroad specialty casting operation.

Schedules Plant Opening

Assembly of nuclear reactor cores is scheduled to start in May at the Olin Mathieson Chemical Corp. plant in Montville, Conn. Construction of the plant is more than 50 per cent completed. Edward Hartshorne is general manager of the Olin Mathieson Nuclear Fuels Div.

Buys Land in Oregon

Armco Drainage & Metal Products Inc., a subsidiary of Armco Steel Corp., bought 15 acres from the Hillsboro Industrial Development Corp., Hillsboro, Oreg., for $27,000. It will be used as a plant site.

Buys Two Chicago Firms

A group of industrialists, headed by H. E. Sullivan Jr. and J. J. Sullivan, purchased Payson Mfg. Co. and Harris & Reed Mfg. Co., both of Chicago. Payson makes industrial casters, builders and door trim hardware, and power sash operators. Harris & Reed Mfg. Co. makes institutional and industrial casters.

Forms Clyde Williams & Co.

Clyde Williams & Co. has been organized at 50 W. Gay St., Columbus 15, Ohio, to assist management of industrial corporations with broad technical and business problems. Officers are: Dr. Clyde

Williams, formerly president of Battelle Memorial Institute, president; B. B. Robe, vice president; Claude Williams Jr., secretary-treasurer and general counsel; J. E. Purnhagen, assistant secretary-treasurer.

Techalloy Enlarges Plant

Techalloy Co. Inc., Rahns, Pa., is erecting an annealing and pickling building. Planned for early 1958 completion, the new building will double the company's capacity for annealing and pickling metals.

Smith Corona Buys Land

Smith Corona Inc., Syracuse, N. Y., is buying 600 acres near Cortland, N. Y., to expand its portable typewriter manufacturing facilities. Elwyn L. Smith, president, said there are no immediate plans for construction.

Forms Stretch Wire Corp.

Stretch Wire Corp. has been organized to serve the electronic and electrical industries with extensible cables. President is M. L. Kaplan, P. O. Box 893, New Rochelle, N. Y.

Bostrom Moves Unit

Bostrom Mfg. Co., Milwaukee, has leased a 70,000 sq ft building in Cudahy, Wis., where it will make seats for trucks, tractors, and earth moving equipment.

Kolcast Becomes a Division

Kolcast Industries Inc., has been changed from a wholly owned subsidiary of Thompson Products Inc., Cleveland, to a division. Of the 43 announced missile projects underway, Kolcast Industries Div. is producing components for about 12.

Nooter Corp. To Build

Nooter Corp. plans to build an office building at 1400 S. Third St., St. Louis, Mo., to replace its present quarters for the company's executive, administrative, and engineering staffs. Nooter fabricates and erects steel and alloy plate processing equipment. Harvey Yaeger, plant engineer, is in charge of construction.

NEW OFFICES

Sutorbilt Corp., subsidiary of Fuller Co., Catasauqua, Pa., opened a branch office at 2966 E. Victoria St., Compton, Calif.

Pratt & Whitney Co. Inc., West Hartford, Conn., opened a branch sales and service office at 466 W. Mt. Pleasant Ave., Livingston, N. J. Joseph G. Brady, district manager of the New York City branch, will direct all activities of the new office.

Stainless Steel Div., Jones & Laughlin Steel Corp., Pittsburgh, opened a sales office at 2795 Wilshire Blvd., Los Angeles 5, Calif. John E. Cottier Jr., is manager of Los Angeles district sales for the division. J&L also has completed construction of a $300,000 district sales and warehouse building at 12301 Hubbell, Detroit, Mich. Dedication of the 18,200 sq ft building is expected this spring.

CONSOLIDATIONS

Peninsular Metal Products Corp., Ferndale, Mich., acquired **George L. Nankervis Co.**, Detroit, manufacturer of testing equipment and scientific instruments for the aircraft and automotive industries, and installer of metal finishing systems.

Norden-Ketay Corp., Stamford, Conn., builder of electronic systems and instruments, will merge with **Solar Aircraft Co.**, San Diego, Calif., subject to approval by stockholders.

Hanson - Van Winkle - Munning Co., Matawan, N. J., acquired **Alert Supply Co.**, Los Angeles, manufacturer of buffing compounds. The New Jersey firm is a manufacturer of electroplating and anodizing equipment, processes, and supplies.

Wayne Pump Co., Salisbury, Md., will merge with **Symington-Gould Corp.**, Depew, N. Y., subject to approval by shareholders. Wayne makes gasoline dispensing pumps; Symington-Gould, railroad equipment.

Miehle-Goss-Dexter Inc., Chicago, is purchasing **Mercury Engineering Corp.**, Milwaukee, maker of printed folding carton machinery and other packaging producing equipment.

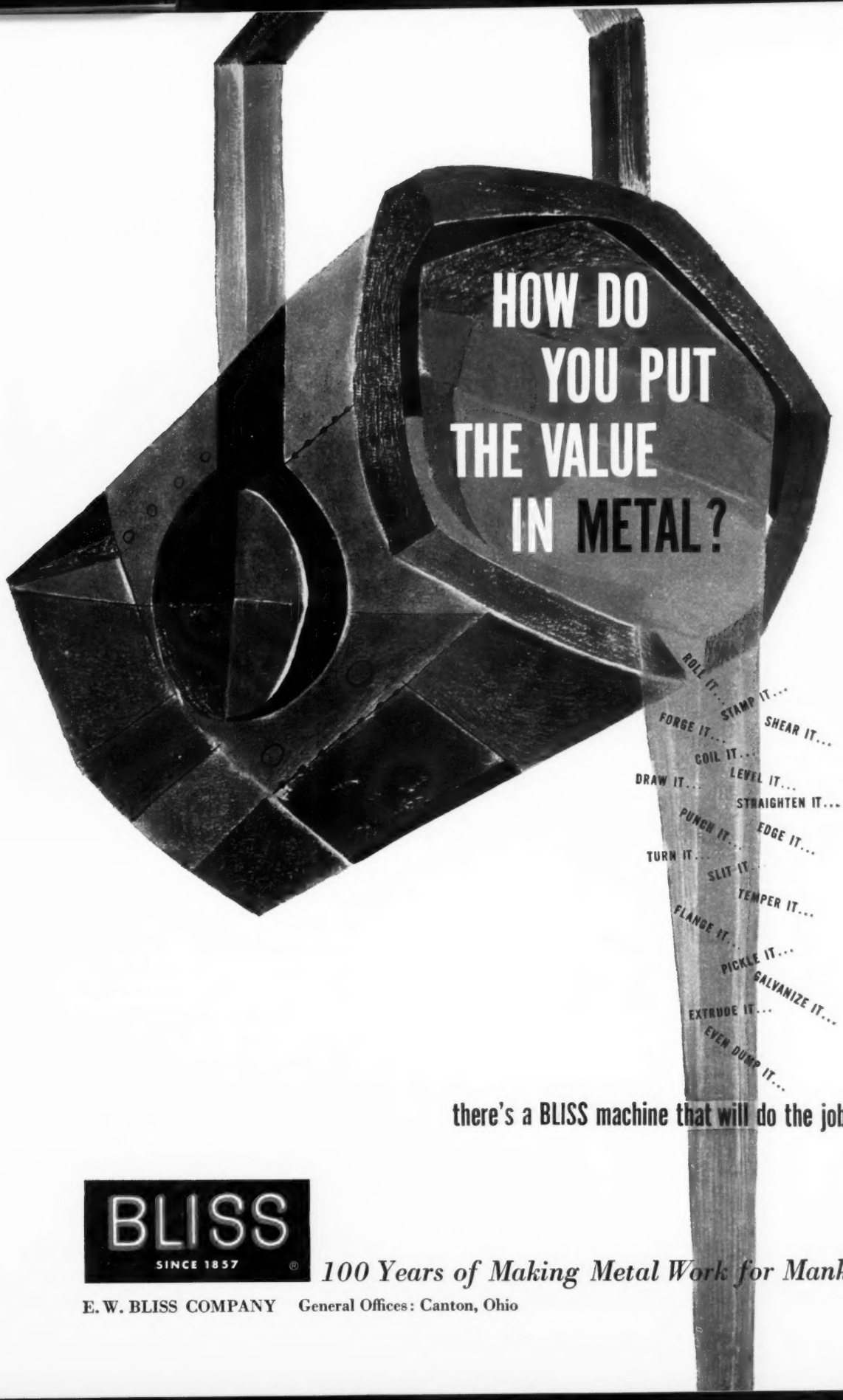
Atlantic Coast Industries Inc. is the corporate name which encompasses these firms: **Bridgeport Rolling Mills Co.**, Stratford, Conn.; **Industrial Metals Corp.**, and **Industrial Chemical Specialties Corp.**, Jersey City, N. J.; **Brickseal Refractories Corp.**, **Saverite Engineering Corp.**, and **Xzit Chemical Corp.**, Hoboken, N. J.; **Atlantic Coast Fisheries Co.** and **Fish Machinery Corp.**, Boston.

ASSOCIATIONS

Institute of Scrap Iron & Steel Inc., Washington, elected these officers: President, Myron L. Chase, Luria Bros. & Co., New York; first vice president, M. K. Mahler, Morrow Steel Co., Detroit; second vice president, E. J. Moskowitz, Schiavone-Bonomo Corp., Jersey City, N. J.; treasurer, Harry Marley, Abe Cooper-Syracuse Inc., Syracuse, N. Y.; and secretary, Ralph Kopelove, Kopelove Iron & Metal Co. Inc., Dayton, Ohio. S. G. Keywell, Samuel G. Keywell Co. Inc., Detroit, continues as treasurer emeritus; Edwin C. Barringer, executive vice president; and William S. Story, director of public relations.

Compressed Gas Association Inc., New York, elected these officers: President, A. R. Olson, Suburban Propane Gas Co., Whippany, N. J.; first vice president, C. E. Monlux, Linde Co., a division of Union Carbide Corp., New York; second vice president, G. C. Cusack, Pure Carbonic Co., a division of Air Reduction Co. Inc., New York; and secretary-treasurer, F. R. Fetherston.

National Association of Corrosion Engineers, Houston, elected these officers: President, L. L. Whiteneck, Plicoflex Inc., Los Angeles; vice president, H. P. Godard, Aluminium Laboratories Ltd., Kingston, Ont.; and treasurer, A. L. Stegner, Tennessee Gas Transmission Co., Houston.



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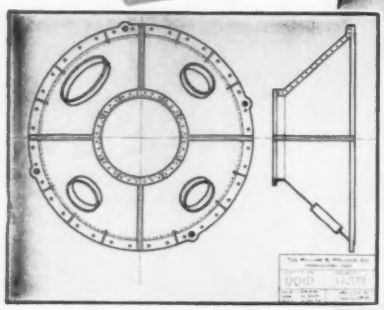
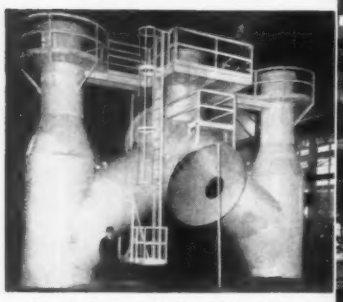
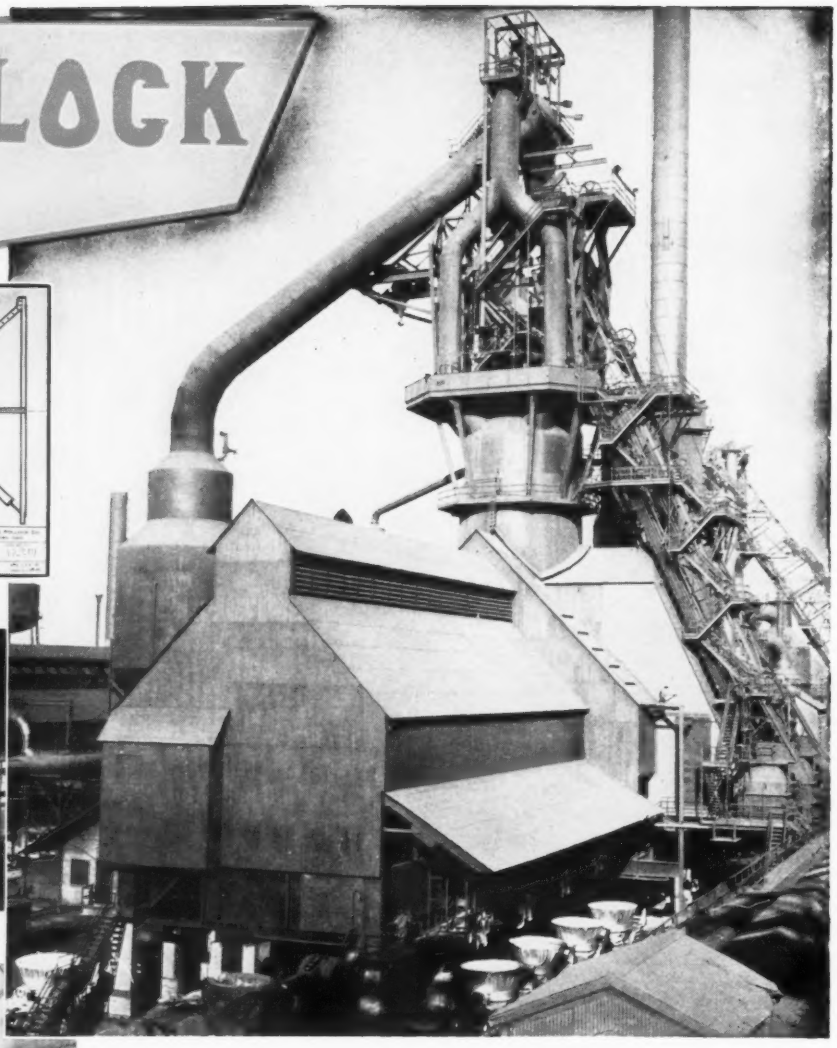


ENGINEERING



SHOP FABRICATION

FIELD ERECTION



Correlating the skills of Pollock engineering, fabrication and field erection to specific operational requirements of The Youngstown Sheet & Tube Company are evidenced in this blast furnace. In addition to furnishing the steel work for this blast furnace, Pollock designed and built auxiliary equipment, including the hot metal ladle cars and cinder cars shown in the above picture. The experience which the Pollock Company has gathered in over eighty-five years is available to you in planning your new projects.

Blast furnace STEEL WORK

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STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAG CARS · INGOT MOULD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES

STEEL
February 10, 1958

Technical Outlook

HOTTER PLASTICS—Short-run dies for hot materials might be a feasible application for a new high temperature phenolic called Astrolite. Made by the H. I. Thompson Fiber Glass Co., Los Angeles, for ICBM nose cones, it resists high temperatures three times better than steel. The reason: Pure silica reinforcing fibers.

AIR POLLUTION TRACER—A new technique tags the gases coming from a smokestack and makes it possible to determine how much of the total air pollution at a point several miles away is caused by emissions from a particular plant. Fine powdered antimony oxide is injected into the stack and air sampling instruments in scattered locations pick up any of the tracer powder that drifts past. The method was developed by Hemeon Associates, Pittsburgh.

SMALL SUPERALLOY TUBING—Many of the superstrength alloys are available in small-diameter tubing. Here are 15 being produced at Superior Tube Co., Norristown, Pa.: A-286, 19-9-DL, 16-25-6, Croloy 15-15N, Inconel X, Inconel 702, Nichrome V, Hastelloy C, Nimonic 75, Nimonic 80A, Hastelloy X, Hastelloy F, Waspaloy, Haynes 25, and N-155. Data on mechanical and physical properties of the superalloy tubing are listed in a new bulletin just released by Superior.

TEMPERING EMBRITTLEMENT—An Air Force research report shows that 550° F tempering embrittlement can be eliminated in SAE 1340 steel by vacuum melting in a system using the principles of the molecular still. It is believed, states the report, that ordinary vacuum melting could not accomplish the same result.

HONEYCOMB ADHESIVES—A new series of heat-curing adhesives for honeycomb sandwiches is said to provide a high combination of peel and beam shear strength at temperatures from minus 70° F to plus 250° F. The supported composite films, called Scotch-Weld by Minnesota Mining & Mfg. Co.'s Adhesives, Coatings & Sealers Div., Detroit, consist of a high strength elastomeric adhesive film on one surface and a self-filleting adhesive film on the other.

HI-TEMP MATERIALS—The new titanium-carbide-base cermets and sintered aluminum products have improved high-temperature properties, state two Air Force sponsored research reports. The cermets have better toughness, higher strength, and good fatigue and impact strengths. The aluminum products have exhibited equal or better unnotched fatigue strength at 800° F than most wrought aluminum alloys at 400 to 500° F, the report says.

STRONGER BABBITT—Wire mesh, embedded just below the surface of large babbitt bearings used in heavy duty equipment, can lengthen bearing life from a few weeks to several years, says Dr. Ing. Joseph Blanderer of Munich, Germany. Dr. Blanderer has patented a method for tinning the mesh and embedding it.

PRODUCTION WELDER—A production welder built by Taylor-Winfield Corp., Warren, Ohio, welds four brackets to front cross members of auto frames at a rate of up to 300 assemblies an hour. Two operators load the cross members and brackets. The 800-kva welder locates the parts, welds, and unloads them.

AGING BERYLLIUM COPPER—A new process eliminates distortion in aging complex beryllium copper parts. Called contour aging, it is being used with springs, diaphragms, wire forms, and capsules. In many cases, distortion-preventing jigs and fixtures can be eliminated, states Metallurgical Consultants Inc., Maywood, Calif., developer of the process.

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Operator welds tubes into tube sheets in vertical position. Automatic device improves quality of field welds. It will handle tubes between ¾ and 1⅛ in.

Device Welds Tube To Sheet

Increased efficiency of heat transfer units requires tight connection between parts. Portable, automatic welder joins nonferrous tubes and sheets with tungsten arc method

BOILERS using higher pressures and nuclear powerplants depend on welded heat exchangers made of corrosion resistant metals.

Allis-Chalmers Mfg. Co., Milwaukee, has developed a portable, automatic welder for one of the critical leak points—the connection between condenser tube and tube sheet.

Description—The unit uses the Heliarc principle. A small tungsten electrode focuses electric current on the joint. Helium shields it from the atmosphere. All an operator has to do is hold the device against the tube end and press the trigger—the welder does the rest.

The machine is driven by a 110-volt motor. A gear reducer furnishes the right speed to rotate the tungsten electrode between 10 and 90 ipm. The unit is connected to a power source (alternating and direct current) by cables which carry cooling water, electric cables, shielding gas hose, and a control cable.

A small cup around the electrode keeps the shielding gas next to the weld zone. A larger one surrounds the electrode and gas shield to protect the operator from radiation.

Operation—To make a weld, the gun pilot is placed inside the tube to be welded. Here's what happens when the trigger is pulled:

1. Gas and water are turned on.
2. High frequency current starts and current contactor closes.
3. The electrode starts to rotate.
4. The arc starts and rotates a little more than 360 degrees while making the weld.
5. Slope control feathers off the current until the arc stops.

Location of the starting point is optional and can be set at any position on the gun. A-C engineers found that the best starting point was either the 3 or 9 o'clock position. The joint fuses more readily when the puddle follows the arc downward.

Preparation — In traditional installations, condenser tubes are either brought through the sheet flush with the surface or flared slightly to fit a countersunk hole.

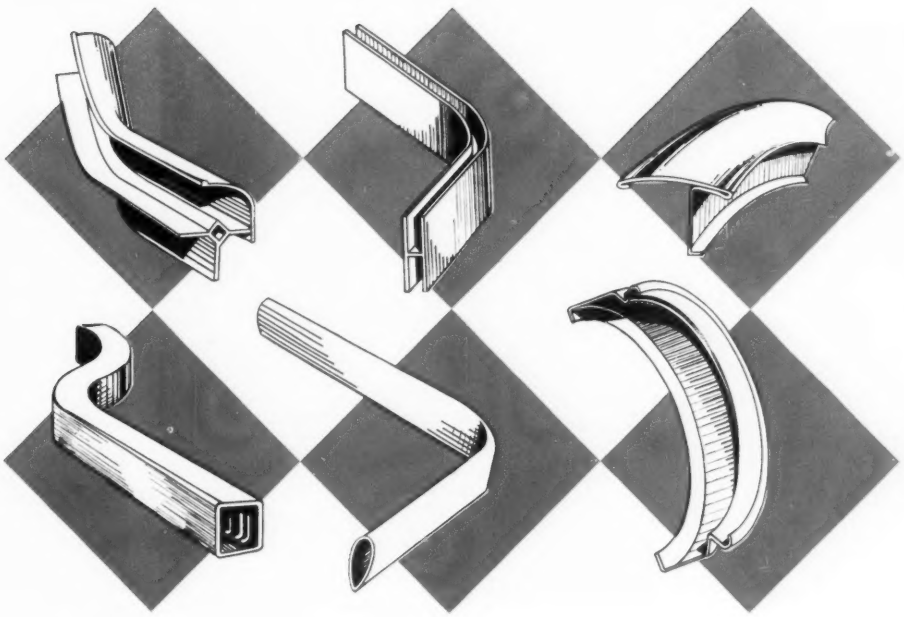
Allis-Chalmers developed a flared hole in the sheet surrounded by a trepanned groove. It eliminates high heat dissipation into the tube sheet and confines the weld to a small area. As a result, current is reduced between 40 and 50 amperes.

That kind of joint also permits easy tube replacement. A repairman mills away the flared end of the tube and weld nugget. When a new tube is inserted and flared, it is welded to the sheet.

Up to three tubes can be replaced in the same hole. That is said to be adequate for the life of most heat exchangers.

Equipment — Power, gas, and cooling equipment for the welder is mounted on a wheeled pallet. It also serves as a water container. A pump circulates water to the gun. Two bottles of gas can be mounted so that the unit can be used in the field. It also holds alternating, direct, or high frequency current sources and slope control for gradual diminishing of the arc. A control box contains the timers and relays.

Future Promise—Although developed for joining nonferrous metals, A-C spokesmen say that there is no reason the device can't be developed for other metals. The tungsten wire could even be replaced by a consumable electrode. Size might be increased as well.



production ideas

NO. 17 OF A SERIES

Bending Machines Form Precision Parts

They accurately bend thin or heavy wall tubes, intricately flanged extrusions, and other shapes to tight radiuses without wrinkling, bursting, or distortion

THE right production method for a product can make the difference between profit and loss, but knowing what's available is often a problem. This article will give you an idea of what bending machines have to offer.

Today's machines are engineered for precision metal forming. Simple bends can be made in high production with low cost tooling. Special tooled units produce compound bends, serpentine bends, return bends, stacked coils, and continuous circular coils. Many of the machines are fully automatic.

Edge Bending—One of the most spectacular jobs is being done by Caterpillar Tractor Co., Decatur, Ill. It involves hot-rolled steel plates, 1¼ x 5½ in., used to support the blades on heavy-duty motor graders. They are edge bent on a 10¼ in. inside radius. A second 30⅛ in. inside radius bend is required on the flat side of the beam. It is made on the same machine with a simple change in tooling.

Previously, the parts were hot formed by bulldozer methods; accuracy was a serious problem. The rigidity of the plates made it difficult to position and weld them to the annular frame if they were out of tolerance. The bends, now formed on a Pines Engineering Co. (Aurora, Ill.) Model 4 machine, are held to plus or minus 1/16 in.

The illustration above shows some of the other shapes being bent on Pines benders.

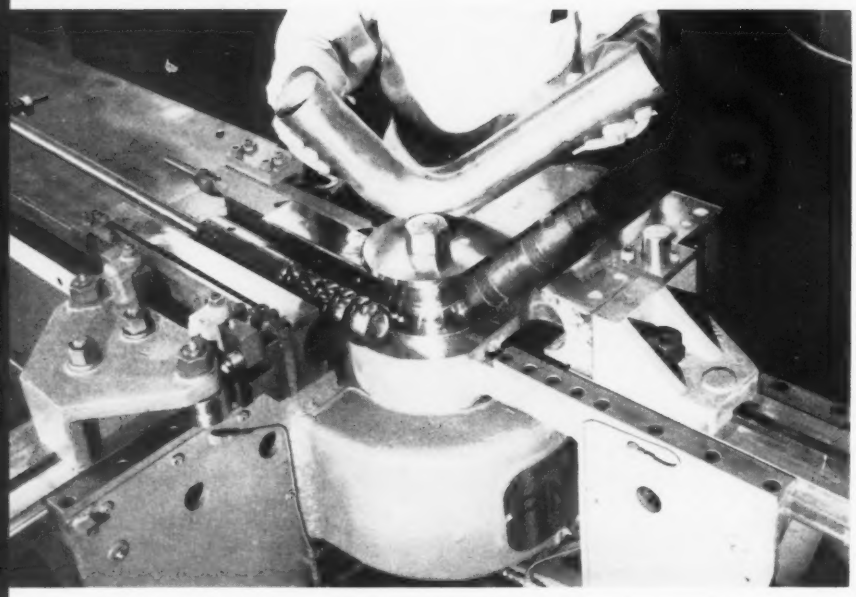
Methods—The motor grader part is made by draw bending, one of five methods used in bending machines. The others are compression, ramming, rolling, and stretching.

With the drawing technique, work is clamped against a bending form which rotates, drawing the piece through a pressure die and, if necessary, over a mandrel. This method offers the best control of metal flow for small radiuses.

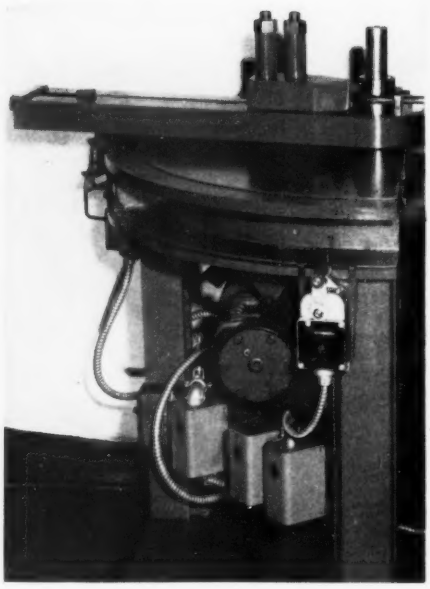
In compression bending, the work is wrapped around a stationary bending form by a wiper shoe. This method is sometimes best for bending rolled or extruded sections. It helps to avoid compound dies when bends must be made close together. It is not practical for mandrel bends when there is more than one bend in the piece.

Ram benders, such as those made by Wallace Supplies Mfg. Co., Chicago, use the compression principle. The bending form is mounted on a powered ram (it can be mounted horizontally or vertically) which moves between two wiper dies. The dies are mounted so they can pivot and wipe the part around the form.

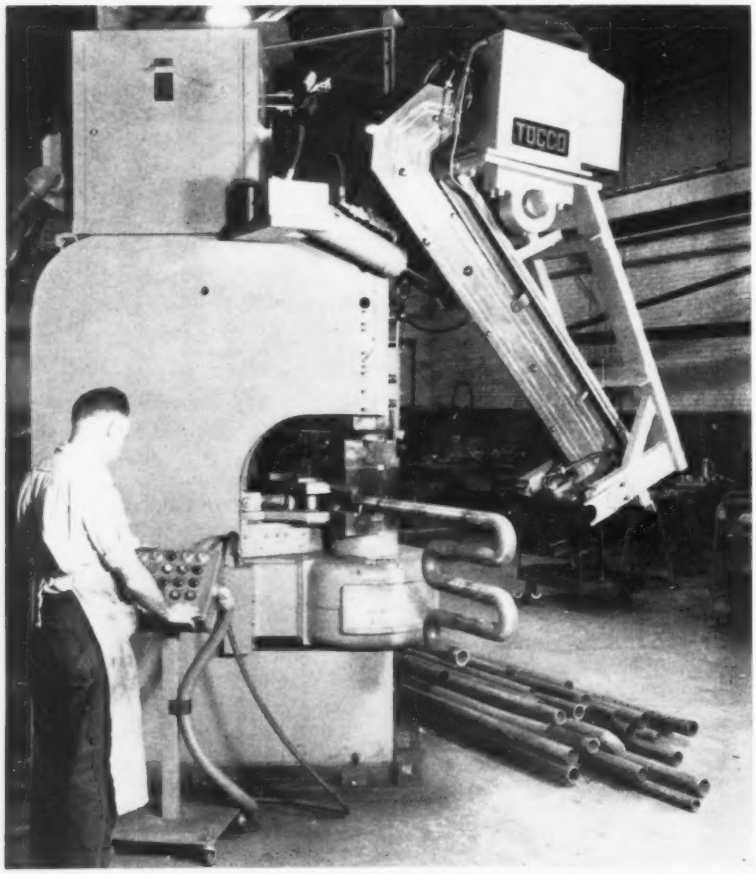
Roll bending is commonly used for round coils. Rings are formed by cutting the coils and joining the



Typical setup for draw bending thin wall tubes on a Pines machine. The four-ball mandrel keeps the tube from flattening; the wiper die prevents wrinkling



Superproduction, doubled-head bender made by Pedrick Tool & Machine Co.



Hot bender, made by Pines Engineering Co., makes 1D radius bends (radius is equal to tube diameter) in heavy wall tubes with less than 5 per cent thinning of the wall on outside of bend. Machine was built for a boiler manufacturer

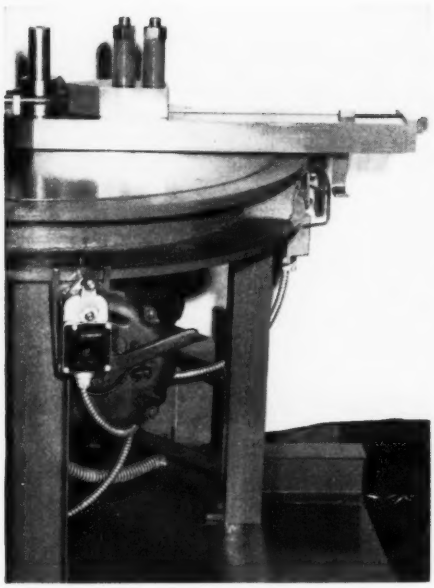
ends. Roll bending can be used to bend pipe and shapes to any radius above a fixed minimum. The method is impractical where there is more than one bend in a piece and is usually limited to radiuses over six times the tube diameter. Control of springback and angles is difficult.

Stretch bending is used to form large irregular curves in sections that do not require mandrels. Developed for the forming of aircraft parts, it has found limited civilian use. The workpiece is gripped by jaws on both ends, stretched beyond its elastic limit, then wrapped around a form. This method reduces springback more than any other but is slower.

Machines—Bending machines are made in a variety of sizes to handle nearly any kind of job. Small hand models, such as those made by O'Neil-Irwin Mfg. Co., Lake City, Minn. (the company also makes power models), do a good job in light manufacturing and maintenance operations. Hydraulic hand benders provide greater bending pressures for heavier work.

In mechanical and hydraulic power benders, there is a wide range of machines for handling large or heavy parts in production.

Where They're Used—You'll see bending machines at work in plants



It makes two bends of different radiuses in a part simultaneously

Vertical roll bender, made by Buffalo Forge Co., Buffalo, is installed at North American Aviation Co. The bending rollers are formed to the shape of the workpiece

making such things as metal furniture, bicycles, baby carriages, heat exchangers, and plumbing goods.

Bent pipes serve as structural members in a lot of farm equipment. There are hundreds of places on a ship where pipes and tubes must be bent to fit the space.

Auto exhaust pipes are bent into irregular curves to fit in and around structural members. Overhead conveyor tracks and monorails are bent on machines.

Boiler Tubes—Bending machines are used to form boiler tubes. On return bends, tight bending radiuses usually are specified to pack as many tubes as possible in a boiler.

Tight bending radiuses on heavy wall tubes lead to excessive thinning out at the outside of the bend. Pines Engineering estimates that bending boiler tubes cold to a 2D radius (twice the tube diameter) thins the wall on the outside of the bend as much as 20 to 25 per cent. Bending cold to a 1D radius thins the wall 30 to 35 per cent.

Due to this excessive thinning, boiler manufacturers have had to specify tubes oversize to meet boiler code specifications after forming.

Hot Bending—Pines Engineering has built two machines for boiler manufacturers that produce 1D radiuses with less than 5 per cent thinning of the outside wall.

The half of the tube diameter that will form the inside of the bend is heated with an induction coil which is mounted on top of the machine (see photo). The heating and bending cycle is automatic: The induction coil swings down over the tube, heats, and moves away. The tube is clamped against the bending form which rotates, pulling the tube through the pressure die and making the bend. A tracer-controlled booster pushes against the end of the tube during bending, keeping

How To Keep Tube Bending Costs Low

1. Select a radius that is an even multiple of the outside diameter of the tube. Your company will have less money tied up in tools. Most bends are made to a 2D radius (twice the tube diameter).

2. Make all the bends in one piece of tube to the same radius. You will need only one set of dies. You will minimize setup time and increase production.

3. Between bends leave a straight section long enough for clamping purposes. Otherwise, the tube will slip during bending. Compound tools are needed if bends are close together, and there isn't enough room for clamping.

4. Avoid specifying close tolerances on the tube ovality at the tangent of the bend. They are difficult to maintain. If a fitting must be connected at the tangent, it is sometimes best to bend the tube after the fitting has been connected.

5. Avoid designing a bend on top of another bend. They are often impossible to fabricate. In almost every case, one of the two bends can be rotated to get the same result.

Can First Cost Be Justified by Production?

COSTS	LOW PRICED low output high labor	MEDIUM PRICED medium output low labor	HIGH PRICED high output high labor	HIGH PRICED superoutput low labor	HIGH PRICED automatic no labor
1. Production (pieces per hr)	200	350	500	1000	2000
2. First cost	$2000	$3500	$5000	$10,000	$20,000
3. Amortization (yearly)	$200	$350	$500	$1000	$2000
4. Amortization (hourly)	$0.10	$0.18	$0.25	$0.50	$1.00
5. Direct labor*	$3.00	$1.00	$3.00	$1.00	$0.00
6. Overhead	$6.00	$2.00	$6.00	$2.00	$2.00
7. Total cost (4 + 5 + 6)	$9.10	$3.18	$9.25	$3.50	$3.00
Piece cost [(7) ÷ (1)]	4.6¢	0.90¢	1.85¢	0.35¢	0.15¢
Suppose required production is 200 per hour for all machines:					
8. Work factor [(1) ÷ 200]	1	1.75	2.5	5	10
9. Amortization (hourly) [(4) × (8)]	$0.10	$0.32	$0.63	$2.50	$10.00
(5) Direct labor*	$3.00	$1.00	$3.00	$1.00	$0.00
(6) Overhead	$6.00	$2.00	$6.00	$2.00	$2.00
10. Total cost [(9) + (5) + (6)]	$9.10	$3.32	$9.63	$5.50	$12.00
Piece cost [(10) ÷ 200]	4.6¢	1.66¢	4.81¢	2.75¢	6.00¢
Suppose required production is 100 per hour for all machines:					
11. Work factor [(1) ÷ 100]	2	3.50	5	10	20
12. Amortization (hourly) [(4) × (12)]	$0.20	$0.64	$1.26	$5.00	$20.00
(5) Direct labor*	$3.00	$1.00	$3.00	$1.00	$0.00
(6) Overhead	$6.00	$2.00	$6.00	$2.00	$2.00
13. Total cost [(12) + (5) + (6)]	$9.20	$3.64	$10.26	$8.00	$22.00
Piece cost [(13) ÷ 200]	9.2¢	3.64¢	10.26¢	8.00¢	22.00¢

Source: Pedrick Tool & Machine Co. Inc.

*Labor costs are quoted at different levels because of the varying complexity of bending machines. Some must be operated by journeyman machinists; others can be operated by unskilled women employees.

the bend area in compression.

Another Problem—It's difficult to give thin wall tubing tight radiuses without wrinkling or bursting, particularly if it is large diameter ducting used in aircraft.

Two special tools for bending machines are the solution. Mandrels are used inside the tube to prevent flattening and wiper dies are used to wipe the tube while it is being bent and prevent wrinkling.

Mandrels fall into three basic types — plug, form, and flexible types. Plug mandrels extend 1/16 to 1/8 in. beyond the tangent of the bend to support the tube wall. A form mandrel, made to fit the curve of the bend, extends farther into the bend and gives more support. Flexible mandrels, with one or more movable balls on the end, are necessary to prevent flattening on thin wall tubes.

Mandrels are always necessary when using wiper dies. They are made with a knife edge that is curved to fit between the bending form and the tube, just behind the tangent point. On tight-radius jobs, they fill the gap between the straight tube and round bending die to keep metal from bunching in compression and wrinkling.

Other Special Tools—A number of standard accessories allow you to get higher production on particular applications.

They include: Distance between bend stops — adjustable stops for locating distance from each bend to one end of the tube; degree of bend selector—automatically stops bending arm at the angle to which it is set; plane of bend selector—permits you to set the machine to make several bends in a workpiece, each in a different plane; plane of bend gages—fast method for locating plane of bend, in relation to previous bend in same piece; mandrel extractor — automatically withdraws the mandrel from the bend at the end of the operation and returns it to the operating position when the bending arm returns. It is always needed when a flexible mandrel is used.

High Production Machines—The first step in buying a machine is to determine what output you want.

You can buy fully automatic machines if your production is great enough to warrant the cost. Operated at capacity production, an automatic machine makes bends at a lower cost per piece than semiautomatic units. But in low production, the cost per bend is prohibitive.

The table at left is used by Pedrick Tool & Machine Co. Inc., Philadelphia, to show its customers how cheap (or expensive) bending can be.

Fully automatic bending lends itself better to compression type than draw type machines. An example is the automatic punch press used as a ram bender to produce shackles for padlocks from straight stock.

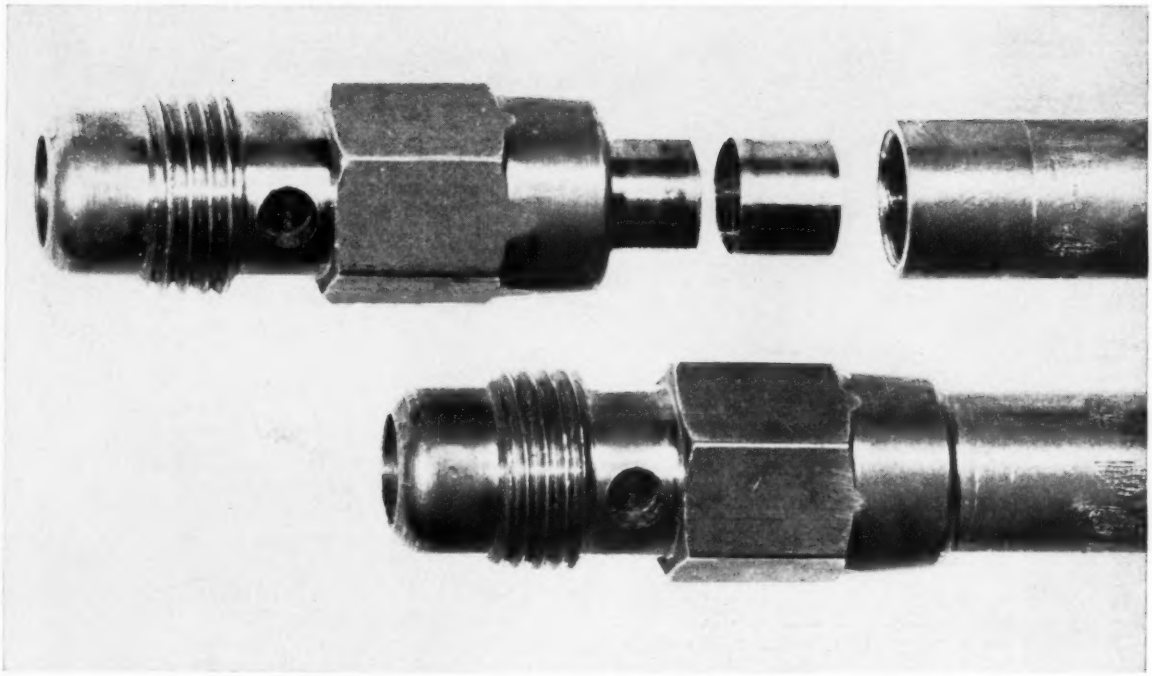
Double Head Unit—Few plants need the capacity of Pedrick's double head bender. The unit is two machines on one base. It has single pushbutton control and individual relay control to permit bending the ends of a workpiece to different curvatures.

The machine will bend, eject, and reset itself in about 10 seconds, making for a theoretical production of six parts a minute. The average operator will produce four a minute, or 240 an hour with two bends in each piece. Bending five pieces at a time gives you 1200 pieces an hour, or 2400 bends. With mechanical loading, you can bend 15 pieces at a time, one piece a second, two bends a second.

The profile bender is another high production machine. Pedrick has a cam type profile bender under development which can make hyperbolas, parabolas, and ellipses in one operation. Rectangles with four right angles can be handled in one operation.

Regardless of your bending requirements, machines that will do the job are available.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*



Brazing alloy clad strip, formed into a cylinder, is used to join this welding torch assembly. When capillary action was depended on to get the brazing alloy down the base of the tube, 30 to 60 per cent of the assemblies were rejects

Brazing Strip Eliminates Rejects

Prediffused to ferrous or nonferrous strip, silver brazing alloy doesn't run on heating. The braze is continuous, uniform, and covers the entire joint area

DESPITE its many advantages, silver brazing has shortcomings that sometimes result in excessive rejects.

They stem from the behavior of silver brazing alloy. When heated, it curls up into a ball; when heated more, it spreads out again, but its flow is unpredictable.

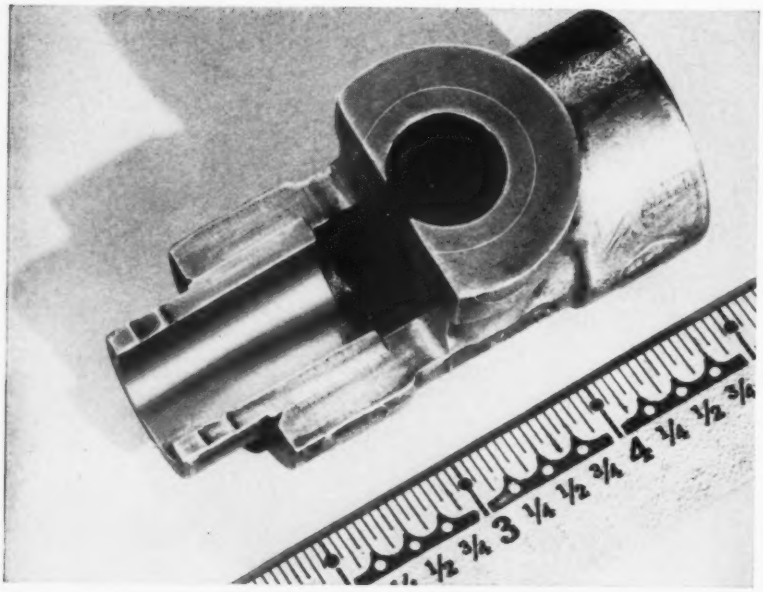
The behavior of the alloy sometimes causes voids, oxide islands, and flux inclusions in the joint. Brazing of blind, lengthy, and complex joints is difficult.

Help—Two corrective approaches are generally used: One is passive—relying on capillary creep to get the metal into the joint. The other is active—relying on the skill of the operator.

A third solution is particularly good for complex brazed joints: The alloy is prediffused (by heat and pressure) on one or both sides of ferrous or nonferrous strip.

Silver brazing alloy can be clad to almost any metal: Low-carbon steel, copper, phosphor bronze, brass, beryllium copper, Invar, Monel, nickel, nickel silver, gold, palladium, platinum, and certain types of stainless steels.

Availability—Manufacturers supply brazing-alloy clad strip in



Joints made with brazing alloy clad strip are continuous and uniform. The braze covers the entire joint, as cutaway of hydrogen pressure valve shows

widths up to 4 in., thicknesses down to 0.003 in. Layers of alloy are clad as thin as 0.000060 in. They can cover the entire surface of the base metal, or they can be clad in strips to any requirements. Tolerances go down to plus or minus 0.0001 in.

The strip can be blanked, stamped, drawn, and machined as if the alloy were not on it. There is no chance of the overlay separating; the bond lasts as long as the laminate itself. It's easy to turn out washers for butt and shear joints, sleeves for tube and socket joints, and irregular patterns to fit almost any assembly. Preplacements can be made to fit the most complex joint. Brazing is carried out with your present heating facilities without adjustment.

Investigation — Five joints were brazed to check the strength of the clad alloys. Joints No. 1 and 2 were made with 0.010 in. clad strip (0.003 in. brazing alloy, 0.004 in. brass, 0.003 in. alloy). Joint No. 3 was made with plain silver alloy strip. Joints No. 4 and 5 were made with 0.015 in. brazing alloy clad strip (0.005 in. alloy, 0.005 in. brass, 0.005 in. brazing alloy).

All of the joints were made on Type 303 stainless steel, 0.375 in. in diameter.

Pull Test Results—Joints No. 1 and 2 had a strength of 56,000 to 72,000 psi; Joints No. 4 and 5, 53,000 to 69,000 psi; and Joint No. 3, 23,000 psi.

The strength of any silver brazed joint depends on three factors: 1. Effective area of the braze. 2. Continuity of the braze. 3. Uniform thickness of the braze. Brazes made with clad strip meet those conditions.

Advantages—Properly used, brazing alloy clad strip can produce perfect joints. Heating time is reduced because capillary flow is not necessary to distribute the alloy throughout the joint. Overheating is avoided.

There are no unwanted overflows, burrs, or fillets that require cleaning. The possibilities of joint design are greater.

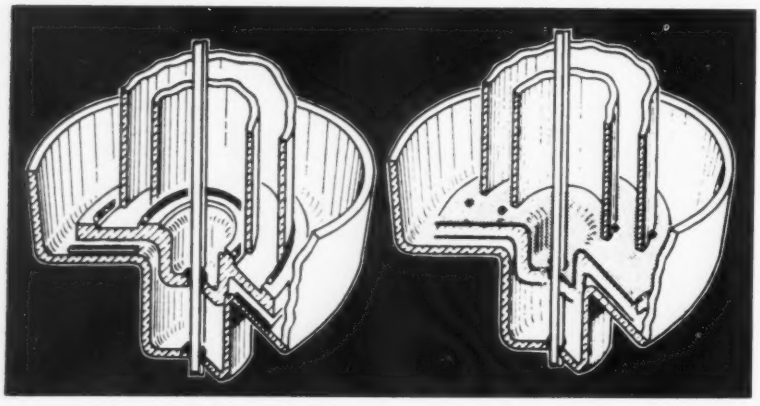
Pressure Tightness—The key requirement of a tube and socket joint in a welding torch assembly (see photo on Page 83) is pressure tightness. With conventional silver alloy, capillary action was depended on to get the alloy down along the base of the tube. It was expensive to remove the unwanted fillet; rejects were high.

The changeover to clad strip saved 47 per cent of the cost, and reduced rejects to a minimum. Controlled flow eliminated the fillet.

Complex Joints—With clad strip, blind joints can be made without guesswork about the strength of the braze.

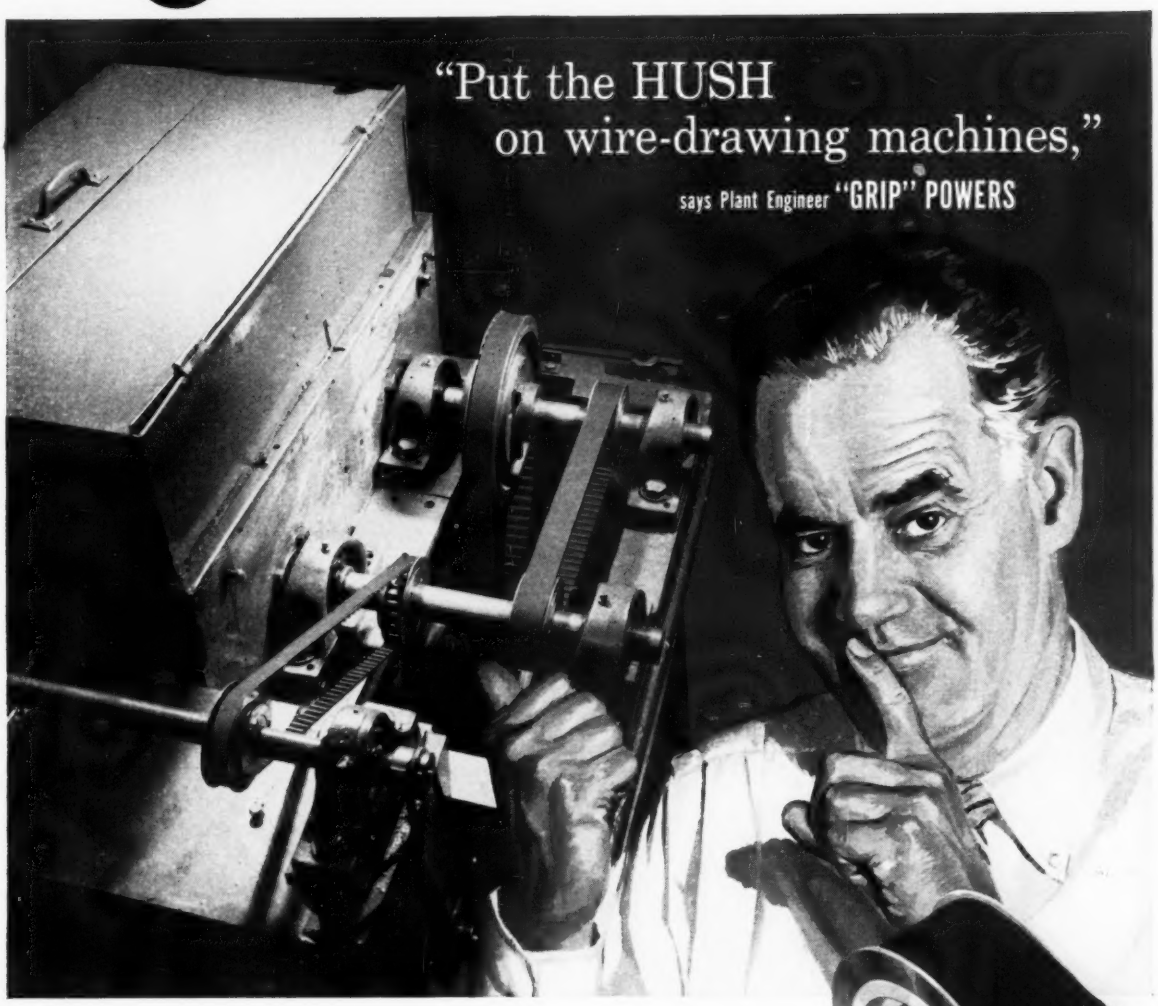
When multiple joints must be made simultaneously, it is possible to use a single part made of brazing-alloy clad strip to tie together many smaller components.

In the drawing at left, a single brazing-alloy clad strip does the work of four brazing alloy rings and one washer in an electronic tube assembly. The base for the alloy is copper.



When multiple joints must be brazed simultaneously, a single part made of brazing strip can sometimes be used to tie together smaller parts. In this electronic tube assembly, strip replaces four brazing rings and one washer

US RUBBER **PowerGrip** "TIMING" BELTS



Wire-drawing machines in a large Indiana factory work 24 hours a day, 7 days a week ... drawing 1,650 feet of wire per minute. The chain drives on these machines caused a deafening noise.

A deafening noise, until a "U. S." power transmission engineer suggested a change-over to PowerGrip "Timing"® Belts. Comparative quiet now prevails: there is no more nerve-racking, unmerciful din. Workers now enjoy radio music throughout the plant. Moreover, cost savings resulted; the belts required no maintenance, whereas the metal belts required taking up twice a year and replacement once a year. The PowerGrip "Timing" Belts have been operating for well over a year, yet there's no sign of wear, no foreseeable need for replacement.

U.S. PowerGrip "Timing" Belts have an efficiency of close to 100%, because they have a positive, non-slip grip. They handle speeds up to 16,000 f.p.m., or so slow as to be imperceptible to the eye. These belts, plus on-the-spot engineering counsel from industrially-famed "U. S." power transmission experts are available at any of the 28 "U.S." District Sales Offices, or from selected distributors, or write us at Rockefeller Center, New York 20, N. Y. In Canada: Dominion Rubber Co., Ltd.

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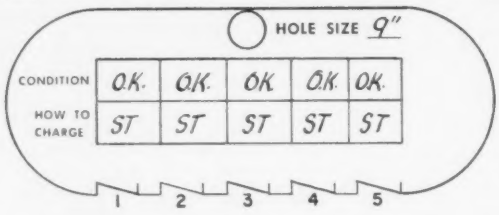
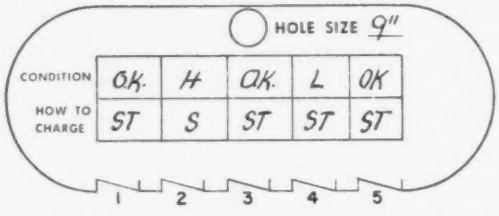
PROGRESS IN STEELMAKING

FURNACE 6 MELTER A TIME 6:10A.M. DATE 10/26/56



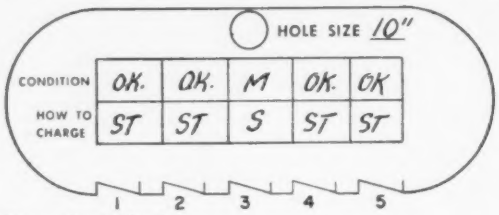
REMARKS:

FURNACE 6 MELTER B TIME 2:30P.M. DATE 10/26/56



REMARKS: Made up Front Banks with Double Burned Dolomite.

FURNACE 6 MELTER C TIME 11:30P.M. DATE 10/26/56



REMARKS: Pipe Next Heat.

Fig. 1—Bottom charging sheet used at Lackawanna Works

Plan for Long Bottom Life

An open hearth furnace out of production because of bottom trouble means loss of tonnage, expensive repairs, and much hard work. Here's one way to cut that downtime

THE BEST WAY to reduce bottom delays is to prevent them from developing, R. M. Jordan, assistant superintendent of open hearths, Lackawanna (N. Y.) plant, Bethlehem Steel Co., recently told the AISI. Speaking before a Buffalo regional technical meeting, he also suggested a way to keep bottoms from getting so bad that a long time is needed to drain off slag and steel and a large amount of material is needed for repair.

Records at Lackawanna showed that the flat at the tap hole was the area of greatest bottom trouble. The method of charging was to put limestone on the bottom at No. 1, 2, 4, and 5 doors and scrap on the bottom at No. 3 door.

Line in Middle—"We decided to charge limestone on the bottom at the No. 3 door to see what troubles we might run into," Mr. Jordan said. "Almost at once we noticed that the bottom in front of the tap hole was staying in better condition. This method of charging reduced the average bottom delay time from 18 hours per month to less than 8 hours. We had no difficulty with hard taps, or with cleaning up the limestone at No. 3 door."

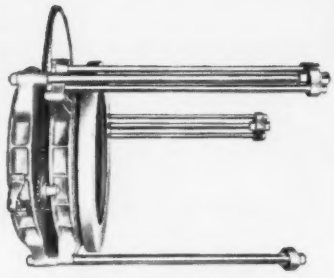
The practice was tried on two furnaces with new bottoms. They have stayed well below the shop average for bottom delays and have required no maintenance at the tap hole except for an occasional dressing with double-burnt dolomite. The practice of charging limestone at all doors has been extended to all 14 furnaces in the shop.

Plan—A chart was devised, showing the outline of the bottom, the five doors, and the tap hole (Fig. 1). The melter marks "High," "Low," or "O.K." on the chart, depending on the condition of the bottom and the approximate size of the tap hole. If the bottom is O.K. or Low, stone is charged at all five doors. It the bottom is high, scrap is charged at that location.

The charts are changed daily and filed. The system gives a running account of bottom conditions and aids in planning repairs.

Between heats, the melter must see that the bottom is fully drained and dried well with raw dolomite. The Lackawanna shop has discontinued the use of aluminum to cut down ridges in front of the tap hole —if it cuts ridges, it is bound to

Fig. 2—Decreasing bottom delays on No. 1 open hearth, reflecting changes in bottom repair and charging practice



Thermal Expansion Type

Linear expansion of the thermal tubes frees the goggle plate for swinging to open or closed position. The contraction of the tubes clamps the plate, forming a gas-tight seal. Sizes: 36" to 120".

Mechanical Type

Powerful clamping force applied at all points around disc periphery provides a safe seal for gas mains from 6" to 84".

Bailey

GOGGLE VALVES

Bailey Valves assure safety plus efficient service on gas washers, blast furnace mains, precipitators and boiler plants. Bailey Valves operate satisfactorily, regardless of the length of time they may stand unused. Their dependability has been proven thoroughly by hundreds of installations in major steel plants.

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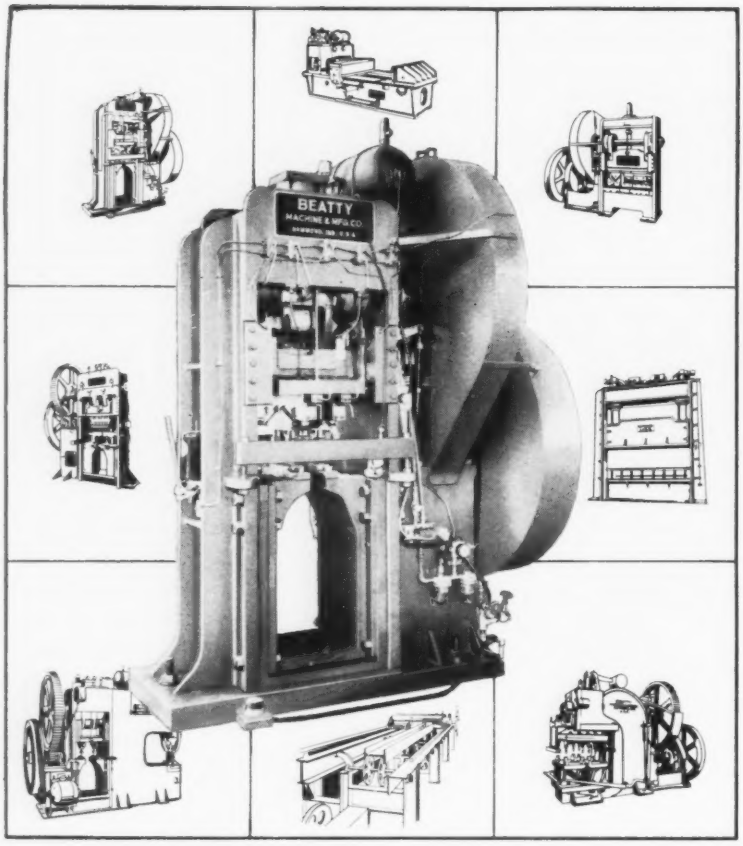


IN ONLY 2 PASSES INSTEAD OF 4 . . .

This new No. 7 Detail Flange Punch accomplishes the flange punching of I-beams in only two passes, where ordinary equipment requires four passes. There's production speed that pays off every hour of operation. Especially designed to speed single-hole flange punching in small structural steel fabricating shops, this compact punch incorporates entirely new design that eliminates the end-for-end turning of beams — requires less floor space than open-throat installations.

The punch has 100-ton capacity, mechanically driven guillotine-type. It will punch up to 1¼" diameter hole through 1" mild steel and handles beams with 6" to 36" webs. Opening through frame is 26"; length of stroke — 2"; distance ram to table, stroke up — 12".

WRITE FOR FULL DETAILS

Get full information on this compact, high production flange punch . . . or on the complete line of Beatty heavy metal-working equipment.

BEATTY MACHINE & MFG. CO.
966 150th St. Hammond, Indiana

LONG BOTTOM LIFE . . .

cut the bottom and tap hole as well. Small amounts of spar are used to cut down the ridges, and if it fails, an air hose is used to remove them.

Temperature—The bath should be brought to tapping temperature as close to tapping time as possible. That way, the bottom is exposed to high temperature for minimum time.

Bath temperature can be controlled by varying the fuel and by keeping ore, burnt lime, or both, in the bath at all times while working the heat to avoid periods with little or no action when the heat is high in carbon. Bath temperature readings should be taken during the working of the heat and used as a guide in firing the furnace. It helps to attain tapping temperature without going over it.

Repairs—But once a hole develops in the bottom, the furnace must be drained, repaired, and charged in the shortest possible time. Nothing is gained by a fast repair job if another is needed after a few heats.

Mr. Jordan feels that although bottom delays have been substantially reduced (Fig. 2), they can be reduced more. The method used at Lackawanna to repair bottoms, banks, and tap holes is given below.

Bottom Repair Practice

Flats — Repairs are made with prepared magnesite in all holes 6 in. deep or more. Limited amounts of spar are used to keep the slag fluid, and the furnace is kept hot so slag and steel can be drained off. The hole is blown out well with air, then filled with water. Dry magnesite is shoveled into the hole. Plenty of water is needed to produce a good mixture and to make sure all ledges and cracks are filled with magnesite.

Water must not be allowed to run out the tap hole (taking the water-soluble magnesite bond with it). If the repair is near the tap hole, it must be closed with a plug of raw dolomite before work is started.

If double-burnt dolomite is not necessary to shape the bottom, the furnace is charged at once, making sure that limestone is put on the repaired area. If double-burnt

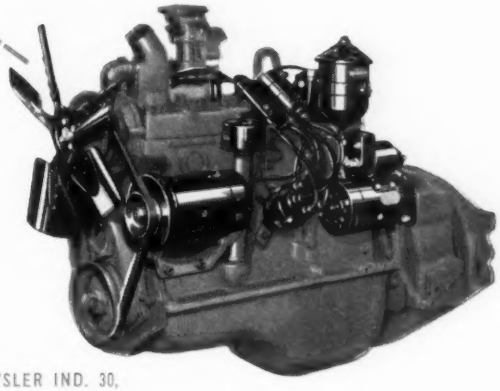
SILENT HOIST & CRANE CO. EXECUTIVES F. E. Flynn, Chief Engineer (left) and M. M. Botnick, General Sales Manager (right) review specifications for the company's latest model Krane Kar, powered by a Chrysler Industrial 30 Engine with fluid coupling. Below, they watch the Krane Kar in operation. This model features an even greater degree of maneuverability and boom flexibility.

why Silent Hoist & Crane Co. powers with **Chrysler** Industrial Engines

KRANE KAR

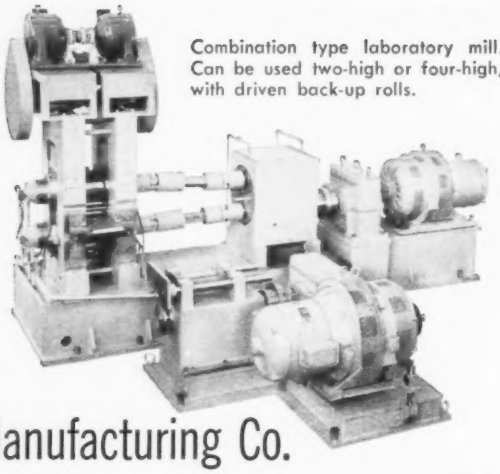
SEND FOR 1958 INDUSTRIAL ENGINE CATALOG: Dept. C2, Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.

Silent Hoist & Crane Co. is a pioneer in the field of heavy-duty materials handling equipment. The famous KRANE KAR and LIFT-O-KRANE are designed for tough jobs and demanding conditions. That's why the company chooses rugged Chrysler Industrial Power. Equally important, Chrysler engines are available with fluid coupling to reduce shock load, prolong engine life. Experience has proved to Silent Hoist engineers, the superiority of Chrysler Industrial Engines. And Chrysler's reputation helps Silent Hoist sell customers—and keep them sold.



CHRYSLER IND. 30, 230 cu. inch displacement engine powers the Krane Kar. Heavier units are powered with Chrysler Ind. 33, 265 cu. inch displacement.

Chrysler
INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION



Combination type laboratory mill. Can be used two-high or four-high, with driven back-up rolls.

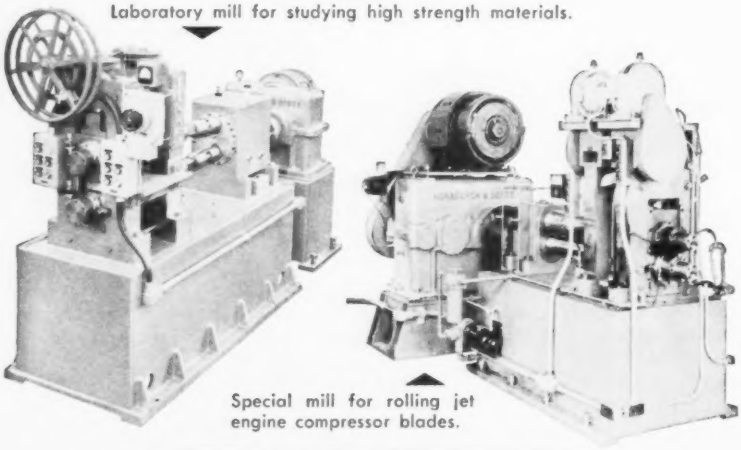
Why
Fenn Manufacturing Co.
equips its precision rolling mills with
H & S Speed Reducers and Gears

Manufacturers of precision metal forming equipment, the Fenn people necessarily must buy carefully when selecting components from other sources. When it comes to speed reducers and worm and gear sets, they rely on *Horsburgh & Scott.*

The Fenn rolling mills illustrated here are built to order for both production and laboratory use. H & S Speed Reducers are in evidence, sized to suit the need. H & S worm and gear sets are used in the screw down mechanisms.

The rugged dependability of H & S products, helpful and flexible engineering service, and reliable delivery performance are principal values in a continuing profitable relationship . . . There's a solution to *your* power transmission problem in the broad lines of gears and assembled units made by H & S. Write us, or contact your nearby H & S representative.

Laboratory mill for studying high strength materials.



Special mill for rolling jet engine compressor blades.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

LONG BOTTOM LIFE . . .

dolomite is used, the furnace is run for 45 minutes, using full fuel and a five-door blow prior to charging. This prevents cold air from being drawn in through the wicket holes and cooling off the bottom and banks that need to be set by heat.

The furnace will come up to temperature fast, and, usually, the fuel must be cut back before the 45 minutes are up to keep the roof from burning. The bottom is charged with limestone, and a higher carbon heat than usual is produced because of lower tapping temperature.

Tap Holes—If the tap hole is getting large, plans are made to pipe it on the next heat. This allows time to get materials mixed, air hose connected, and the 1 in. pipe and tap hole pipe put in place before the heat taps. A light pneumatic gun is used to dig out the facing and steel in the tap hole; a button head is used to tamp the magnesite around the tap hole. This type repair takes little more than the 40 minutes allowed to make up the furnace between heats.

Major tap hole repairs are made only on bottom jobs. When a bottom is getting low and not draining properly—but without developing any serious holes—it is raised and shaped with double-burnt dolomite. The job is planned so that materials for the tap hole are available and the dolomite gun is full of double-burnt dolomite before tapping the heat.

The tap hole is blown first and the bottom drained. While the facing is being dug out, the crew using the dolomite gun makes up the banks, ends, and flat at No. 1, 2, 4, and 5 doors. Next, magnesite mixed with water is shoveled into the tap hole and the bottom dressed at No. 3 door to proper height and shape. The furnace is fired as for a flat repair.

Banks—Repairs are made with prepared magnesite mixed with water so that it can be shoveled. The mixture is used in all holes over 4 in. deep, or where large areas of the slag line are badly cut. After the magnesite is applied, the banks are shaped with double-burnt dolomite. The furnace is charged at once, making sure it is blowing extra hard during charging, so that the banks are set.

NEW! "Feather-touch" PUSH-to-TEST PILOT LIGHT

Added to Square D Oil-Tight Pushbutton Line

Completely oil-tight, even when depressed

Pressure connections eliminate internal wires

Positive contact "feel" in test position

No additional panel space required

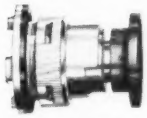
Choice of 6 color caps

Full range of voltage ratings

Mounts interchangeably with oil-tight pushbuttons and selector switches

OIL-TIGHT OPERATORS

Standard Button


Mushroom Button

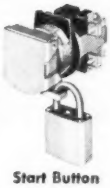
Selector Switch

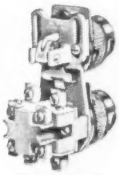
Coin-Operated Selector Switch

Key-Operated Selector Switch

Selector Pushbutton

Stop Button Lockout


Start Button Lockout


Maintained Contact Attachment

NEW!

Selector Switch and Pushbutton Lockout

4-Position Joystick Operator

Wobble Stick Operator

Neoprene Cap

Here's why Square D Pushbuttons are preferred —by those who *build* machines—and by those who *buy* them!

Easy to use • Operators require only a single mounting hole for quicker installation. Pressure wire connectors mean simplified wiring.

Longer lasting • All-metal operator construction, anodized aluminum buttons, mean greater mechanical life. Melamine contact blocks with double-break silver contacts assure longer electrical life.

Wide flexibility • Any operator can be used with any contact block to meet all your requirements.

Small size • Only a minimum of panel and back-of-panel space is required.

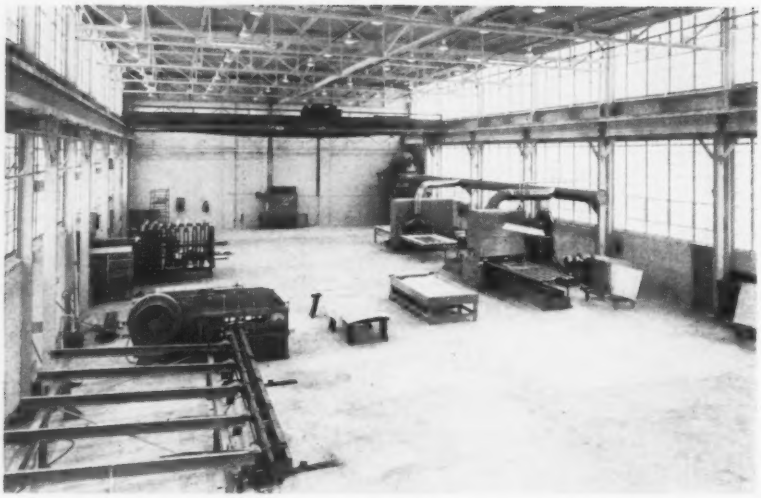
Variety of contacts • Contact block arrangements include single-pole double-circuit, duplex double-circuit, tandem duplex, three-position duplex, and overlapping contacts.

• • •

FOR COMPLETE INFORMATION on oil-tight pushbuttons, send for Bulletin 9001-T to Square D Company, 4041 North Richards Street, Milwaukee 12, Wisconsin.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY



Research building for pilot runs is 60 ft long, has 16-ft clearance under the crane hook. At right: Abrasive belt grinders. At left: Threading machine and an automated shear

Better Odds for the Buyer

HOW DO you evaluate a new process or a new machine? One answer is to put your parts through full-scale trial runs on the proposed equipment.

Many equipment builders are making this easy to do. In the interest of getting the order, they will set up and run the trials for you. It's their answer to a problem that has plagued too many prospective buyers: Committing large sums of money without full assurance that the equipment will do the job.

What's Being Done — Take the case of Hill Acme Co., Cleveland. Its new research building (separated from main production facilities) is designed "to process representative quantities of customers' material to establish and prove technique, quality, and production available on our machine tools."

A buyer who's interested in trying one of the company's machines, say an abrasive belt grinder, can send workpieces for pilot runs at the research facility. The trial runs, which duplicate production setups, will tell him whether the equipment will do his job and will establish the best setup and tooling. He can also learn what production rates will be and get a clear idea of costs.

Machines now installed include a reciprocating-table abrasive belt machine for grinding and polishing that's 50 in. wide; a continuous process abrasive belt machine that's 60 in. wide and is of the pinch roll type; a 2-in. single spindle threading machine, and a bar-billet shear that's completely automated with magazine and power feed table. A forging machine and a surface grinder will soon be added to complete the line-up of trial equipment.

Now under pilot trials on the belt grinders: Buffing of Plexiglas, finishing mild steel truck bumper stock, grinding and finishing stainless, prefinishing brass strip prior to cold rolling, grinding and finishing titanium sheets.

Tap Swages Thread

If you have trouble tapping ductile metals like aluminum, brass, or leaded steels, a new tool made by Besly-Welles Corp., South Beloit, Ill., may help. Called the X-Press tap, it has no flutes. Instead of cutting, the tap generates a thread by cold forming it.

Advantages cited: Higher tapping speeds, stronger threads, better tool life.

Grinds Piston Pins

Automatic loading and through-feed link six machines, insure 4 microinch rms finish

A NEW line of six Landis centerless grinders automatically finishes 2100 engine piston pins an hour.

The grinders are loaded from an elevator loader and tooled for continuous throughfeed.

Operation—The loader at the front of the illustration (below) receives heat treated, rough ground pins. They are loaded automatically on the first grinder, ground to size, then pass on to succeeding operations.

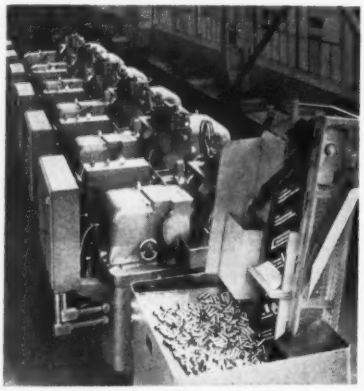
Chain conveyors carry the pieces between machines.

The operations remove 0.008 to 0.009 in. of stock. Final limits are zero to minus 0.0002 in. for the diameter and 0.0001 in. for roundness and straightness. Finish is within 4 microinches rms.

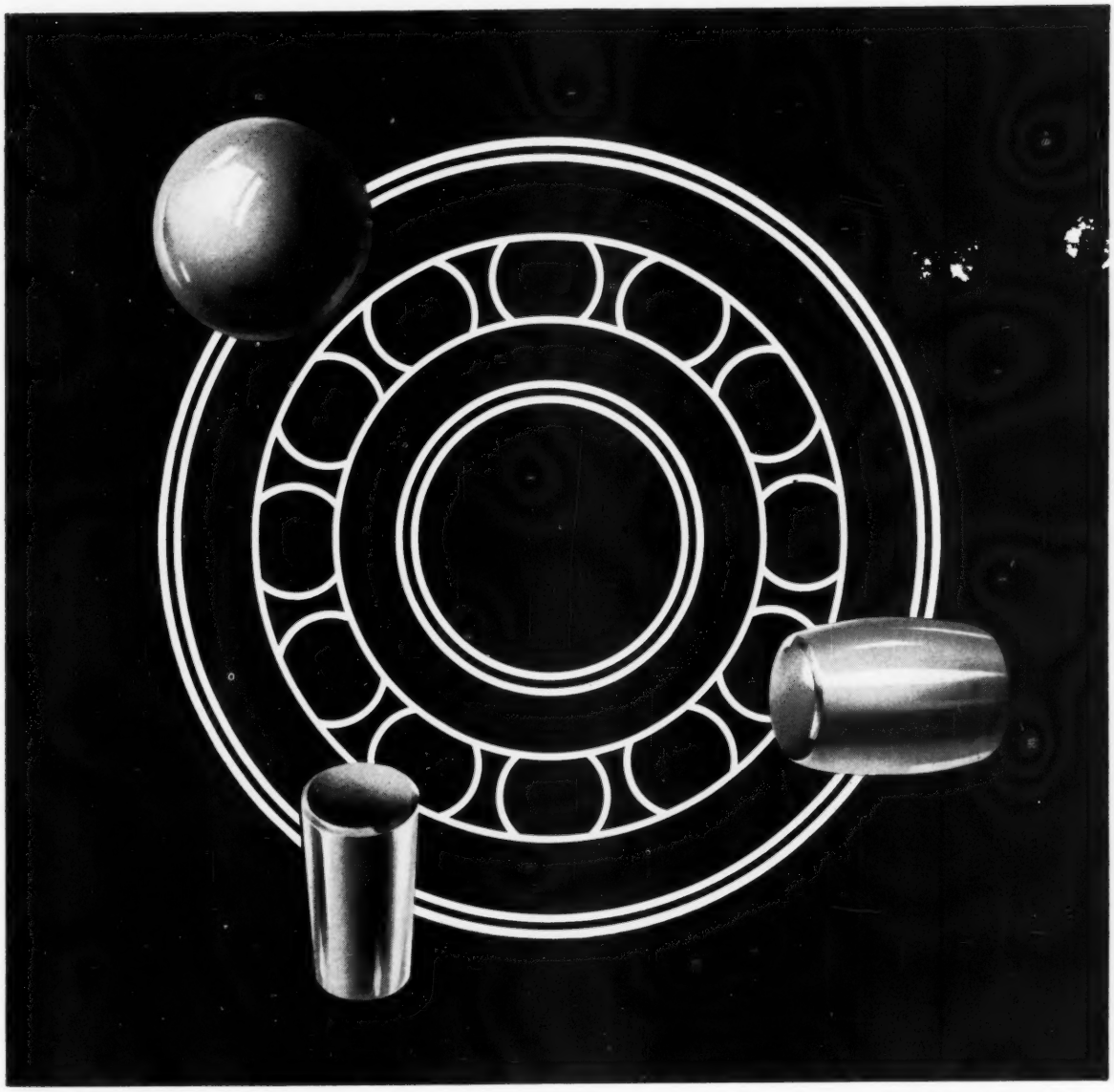
Each machine has its own gaging system. Pieces are measured continuously as they are ejected from the machine. Warning lights tell the operator when a piece is over or under size.

Coolant Filtered—The first four machines in the line are connected to a central coolant system. The last two use a special coolant which is filtered by a combination fabric and magnetic filter.

Each machine has progressively finer wheels to insure lighter cuts and improve the finish. Grinding wheels are given correct entrance and exit throats by profile bars which guide the dressing tool.



These Landis grinders are linked by chain conveyors. They cut 0.008 in. off hardened pins. Output: 2100 an hour



cut bearing maintenance . . . with one lubricant

Nebula EP – another first for Esso Research – is a multi-purpose grease that *out-performs* all other multi-purpose greases. And many specialized greases as well!

Nebula EP works exceptionally well in ball, tapered roller and roller bearings – of *all sizes* from rolling mills to precision instruments.

Nebula EP stands up under extreme heat. It retains its lubricating qualities at high temperatures at which many special heat-resistant greases would have broken down.

And Nebula EP has exceptional water-resistant and rust-preventive properties – an important consideration where water is a factor. What's more, Nebula EP is formulated with a true soap which gives it extra anti-wear and load-carrying characteristics – for an extra margin of protection. High oxidation stability gives Nebula EP longer life in storage and in use.

FREE...Brochure on Nebula's constant consistency-temperature properties...how it does the job of many greases...and better. Write *today* for your copy: Esso Standard Oil Company, 15 West 51st St., Room 3121, New York 19, N. Y.

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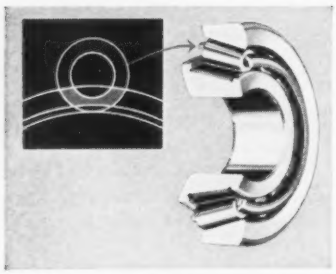
PETROLEUM PRODUCTS

Bearings "keep cool" under hot steel!



HIGHER FLANGE IMPROVES ROLLER ALIGNMENT

As shown by the gray area above, the higher flange provides a large two-zone contact area for the roller heads. This greatly reduces wear—practically eliminates "end play". Larger oil groove provides positive lubrication.

Watch it! Coming down the line—another half-formed slab of red-hot steel! And with it comes a supreme test of bearing excellence. Bower Bearings are equal to it—helping to keep this mill operating smoothly and continually despite heavy loads and extreme temperature. Whatever the job, there's a Bower Bearing engineered to perform just as dependably when the going is toughest. Rigid quality controls and basic bearing design refinements like those shown at the left have reduced Bower Bearing failure to a practical minimum. If your product uses bearings, specify Bower! There's a complete line of tapered, straight or journal roller bearings for every field of transportation and industry.

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SPHER HONED

BOWER ROLLER BEARINGS

Operator bores two lower bearing brackets at the same time. It's an easier set-up than boring a semicircle. Full circle boring makes efficient use of the machine

Makes Most of Machine Time

Lower bearing brackets for large motors are tackwelded together on this fixture. Welds are broken after boring

Fabricating technique enables electrical machinery manufacturer to double the output of a boring mill operation

TACKWELDING motor bearing brackets together before boring is eliminating some machining problems and making more efficient use of machine time at Electric Machinery Mfg. Co., Minneapolis.

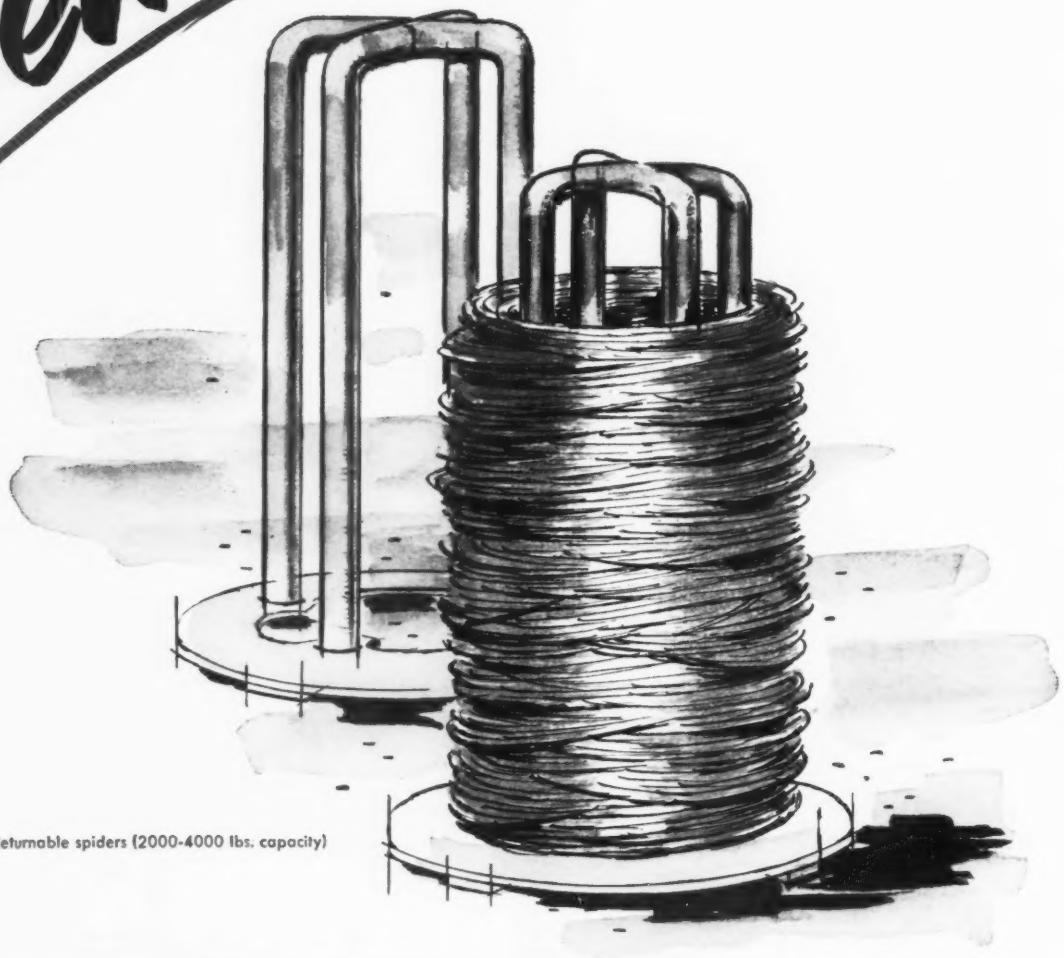
Large motors which use sleeve bearings normally have two-piece bearing brackets. Sometimes, only a lower bracket is used with an upper housing cap.

That's when machining becomes troublesome. The area to be bored is a semicircle; it takes extra setup time. The boring tool is cutting air half the time.

Fabricating Technique—By tackwelding two lower brackets together, the fabricator is able to bore a full circle. Then the welds are broken. An upper bearing housing cap is bolted to the lower bracket to form a complete load carrying member.

The small holes in the bracket are jigged and bored on smaller high speed machines. This releases the big boring mills for larger, more productive work.

New 3000-4000 lb.



Returnable spiders (2000-4000 lbs. capacity)

Here is a partial list of the many types of carbon steel wire manufactured by CF&I:

Grades

low carbon
- annealed
- flat and shaped

medium high carbon

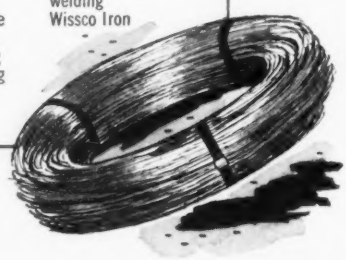
high carbon
- flat and shaped
- oil tempered
- spheroidized

Finishes

- bright dry drawn or lime bright
- bright grease drawn
- cadmium coated
- coppered
- extra clean
- smooth bright
- galvanized
- liquor
- white liquor

Standard Types (partial list)

- aircraft cord
- bee
- bobbin ring
- bobby pin
- bookbinder
- broom
- brush
- casing
- clip
- concrete reinforcing tie
- cotter pin
- curtain spring
- die spring
- fine & weaving
- fuse
- Gamma spring
- garment hanger
- glass netting
- hair pin
- hat
- hose, reinforcement
- hose, mechanical
- hose, vacuum
- lock spring
- lockwasher
- manufacturers' drawn
- mattress
- merchant
- nail
- oil tempered
- picker tooth
- picture cord
- pin ticket
- regulator
- rope
- safety pin
- screen
- shaft, flexible
- Signal Corps
- snake fishing
- spiral binding
- spring
- square
- stapling
- staple
- stone
- tie
- twisted & laid
- upholstery
- valve spring
- weaving
- welding
- Wissco Iron



Steel strapped coils (200-2000 lbs.)

WHEN YOU NEED WIRE . . . MAKE

CONTINUOUS WIRE "SPIDER"
. . . cuts downtime as much as 15%
. . . reduces scrap loss

Here's what CF&I's new giant package did for one upholstery spring manufacturer who had been using 700-lb. wire coils:

- **Downtime was reduced**
- **Production was increased 15% per shift**
- **Men and materials handling equipment were freed for other work**
- **Scrap losses were reduced**

These returnable spiders will cut your production costs, too. If your manufacturing process is not equipped to use spiders, order our 200-2000 lb. continuous-length, steel-strapped wire coils. (Sizes #13 AWG and coarser apply for both spiders and coils.)

From spools to spiders . . . CF&I's newly modernized and enlarged plants are equipped to provide fast delivery on high or low carbon steel wire . . . round, flat or shaped . . . in a wide variety of sizes, tempers, grades and finishes . . . in small quantities or carload lots. Let us know your requirements.

CF&I-WICKWIRE WIRE
THE COLORADO FUEL AND IRON CORPORATION

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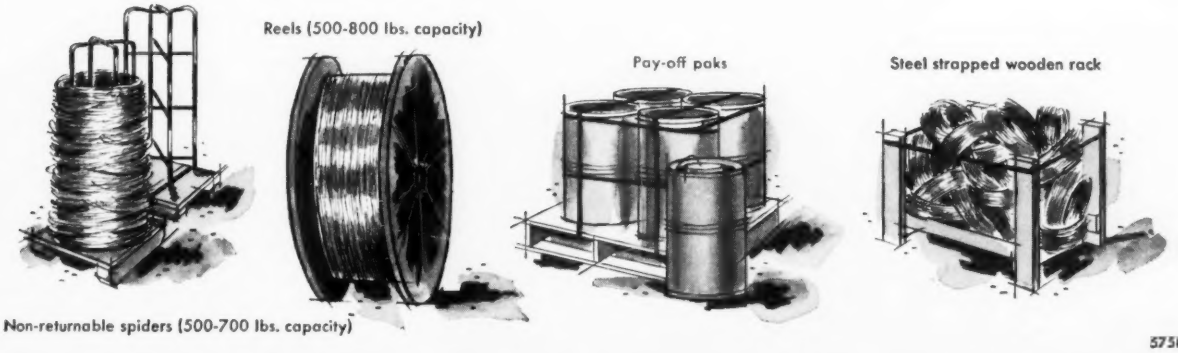
Other CF&I standard packaging methods



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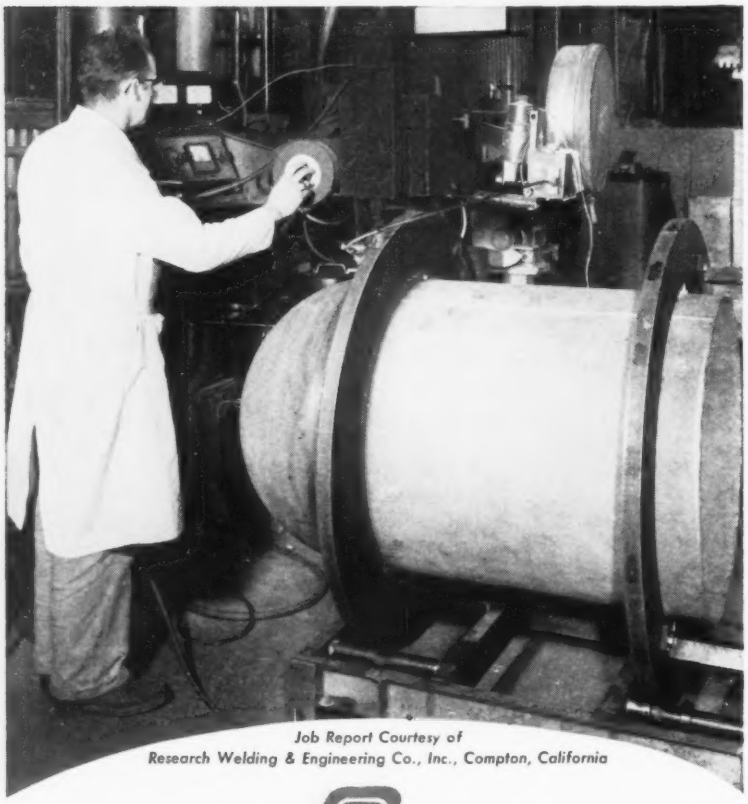
CF&I YOUR SOURCE OF SUPPLY

For flawless high strength weld metal in missile components



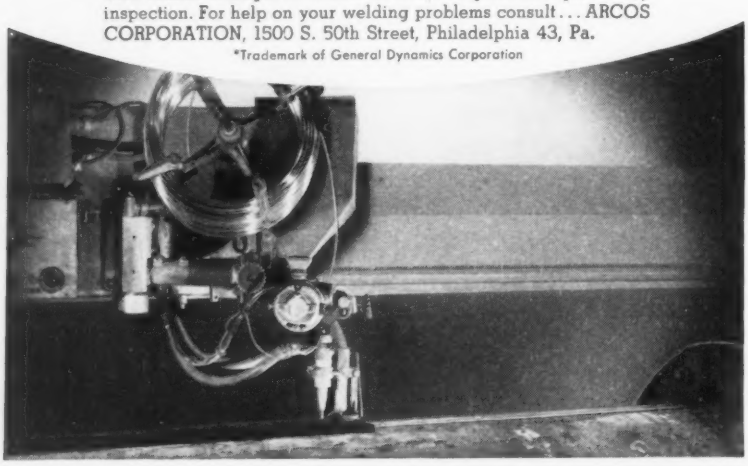
Job Report Courtesy of
Research Welding & Engineering Co., Inc., Compton, California

WELD WITH ARCOS

CHROMENAR Spooled Wire

Light weight was important in this welded missile component that was required to hold air under 3,000 p.s.i. pressure. After making the root pass weld with the Arcos EB* consumable insert, the weld was completed by submerged arc welding with Arcos CHROMENAR CMV welding quality wire. CHROMENAR CMV was selected because its weld metal could be heat treated to match the base metal with tensile strength in excess of 200,000 p.s.i. and pass x-ray inspection. For help on your welding problems consult... ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.

*Trademark of General Dynamics Corporation



Casting for Atoms

Specifications for reactor valves and fittings can be met by stainless steel castings

THE BOTTLENECK in the production of nuclear plant components caused by variations in castings can be broken. Herbert J. Cooper, Cooper Alloy Corp., Hillside, N. J., told the Atomic Industrial Forum in New York that three factors must be considered:

1. Material selection to attain the required properties.
2. Proper design to insure that flaws are not in the casting.
3. Use of proper foundry techniques.

Case History — Cooper Alloy's experience came from the production of primary loop valves and fittings for the Spert III reactor of the Atomic Energy Commission.

Specified for the castings was 304 stainless with a maximum of 0.03 per cent carbon. Cooper Alloy's study of the properties of the alloy at 670° F showed that it exceeded specifications.

AEC Specifications for Spert III Piping

Yield Strength	Tensile Strength
18,300 psi	51,000 psi

Cast 304 Stainless (90 heats)

Yield Strength	Tensile Strength
22,000 to 28,000 psi	53,700 to 66,300 psi

These values were obtained by a careful balance of the chemistry which introduces more than 10 per cent ferrite into the structure.

The analysis of the resulting alloy falls within the ranges permitted by ASTM A351-52T covering ferritic and austenitic steel castings for high temperatures.

Big Problem — Some people charged with the design and construction of nuclear power reactors have been dissatisfied with the casting industry because of difficulty of producing castings which meet Class II or Class I of the X-Ray Specifications (ASTM E71). Mr. Cooper says this problem can be overcome by viewing the casting of stainless steel as an engineering problem, not as a strange art.

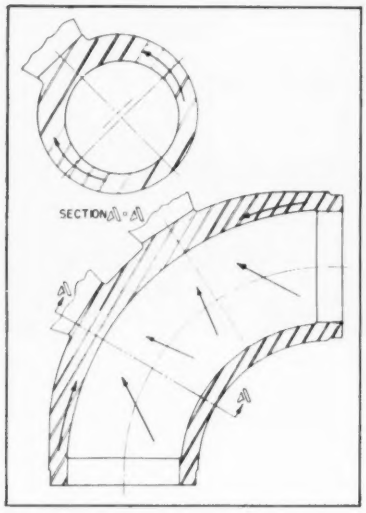
Solution—The basic laws of metal solidification must be applied to

CASTING FOR ATOMS . . .

valve and fitting castings. Progressive solidification must be used to eliminate centerline shrinkage.

The illustration, below, of a 90-degree elbow designed for service at 2500 psi and 670° F shows how progressive solidification has been applied to the design. Minimum wall section lies at the ends and along the small radius. The sections taper gradually to the back of the fitting where it is risered.

Many have been cast free of shrinkage to Class I quality.



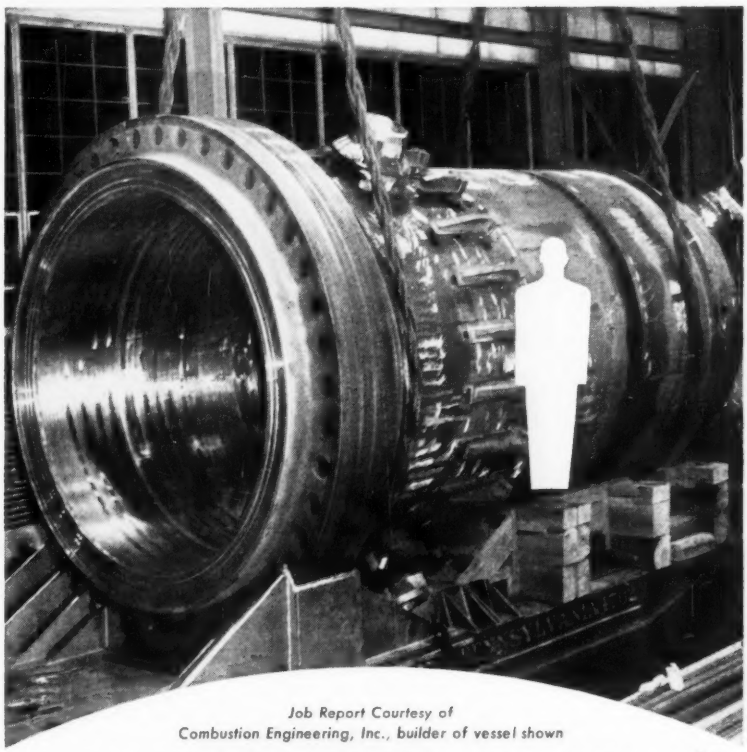
Extensive Use—In applying progressive shrinkage to more complex parts, such as valve bodies, it is important to keep bosses and lugs to a minimum since they cause concentrations of metal which may be difficult to riser.

Usually, a 3½-degree taper is sufficient to achieve Class II x-ray quality. Of course, metal sections determined by a 3½-degree taper over the longest distance in a given feeding system will result in greater tapers over shorter distances in the same system.

Controls—Once a design incorporates the principles of progressive solidification, the foundry must establish close control to achieve the design values.

For example, if a core is not carefully made, the ferrostatic forces of the liquid metal may cause the core to deflect upward in the mold just as a beam deflects under load. A deflection of 3/32 in., while small compared with the metal sections involved, may cause the taper to fall considerably below its designed value.

This WELDED nuclear pressure vessel holds a practical idea for you

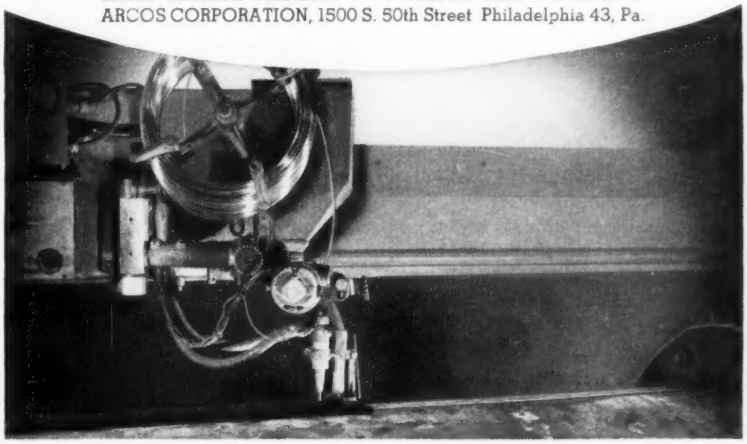


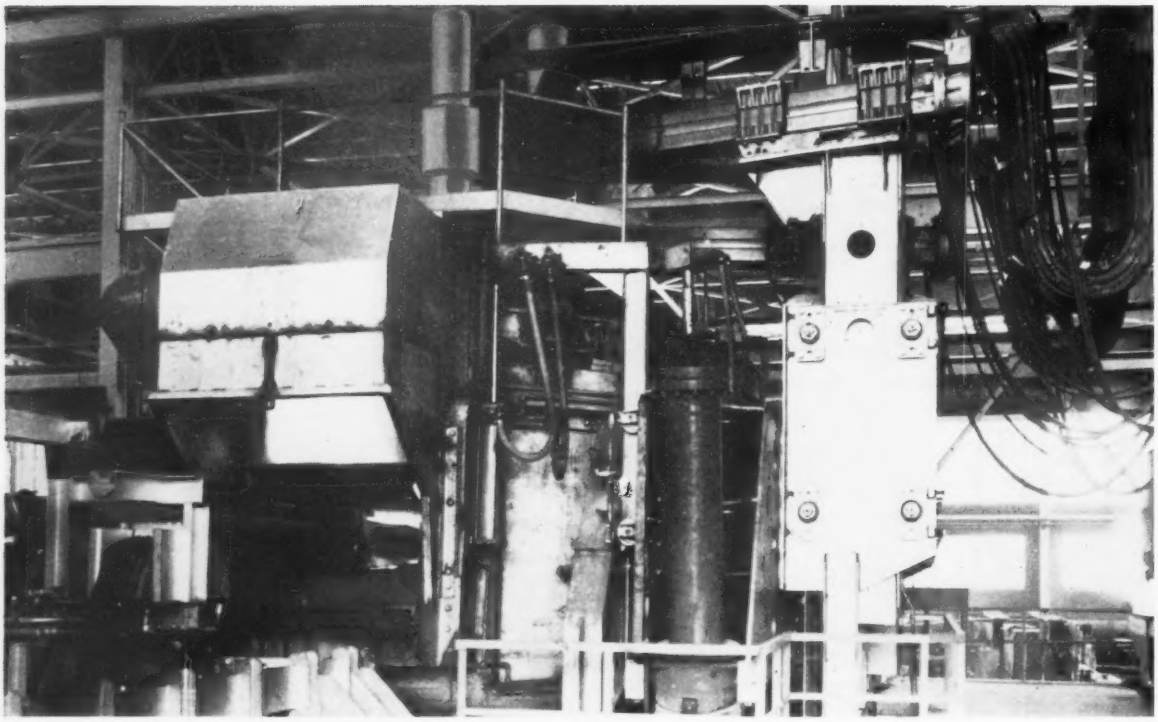
Job Report Courtesy of
Combustion Engineering, Inc., builder of vessel shown

USE ARCOSITE FLUX

for submerged arc welding

In nuclear installations where radio activity makes weld failure dangerous to personnel and can cause indefinite shutdown, sound corrosion resistant welds are of utmost importance. To inhibit corrosion, portions of the 9 ft. dia. interior of this 33 ft. reactor were overlaid with ¼ in. of 308L weld metal. Submerged arc welding with ARCOSITE S4 flux was used for the job. The girth and longitudinal joints of the low alloy steel plates were also submerged arc welded using ARCOSITE B5 flux. Cost-wise, no other conventional method of cladding was practical. Arcos weld metal quality guarantees corrosion resistance . . . freedom from maintenance. ARCOS CORPORATION, 1500 S. 50th Street Philadelphia 43, Pa.





Furnace at American Smelting & Refining Co. produces a ton of tough-pitch copper every 2 minutes. The unit has three 18 in. diameter graphite electrodes which can be rapidly raised and lowered hydraulically

Copper Melting Arc Furnace Starts Up

Unique features of the installation are its size, power to fuel ratio, preheating and sulfur control, method of charging, highly responsive electrode control system

AMERICAN Smelting & Refining Co.'s new electric melting furnace at Perth Amboy, N. J., can continuously produce 30 tons of high quality, tough pitch copper an hour.

The company says its 18 ft diameter furnace (capacity is 90 tons of molten metal) is the largest of its kind. It uses three 18 in. diameter graphite electrodes which are hydraulically controlled. The transformer is rated at 8000 kva, with a maximum rated current of 30,400 amperes.

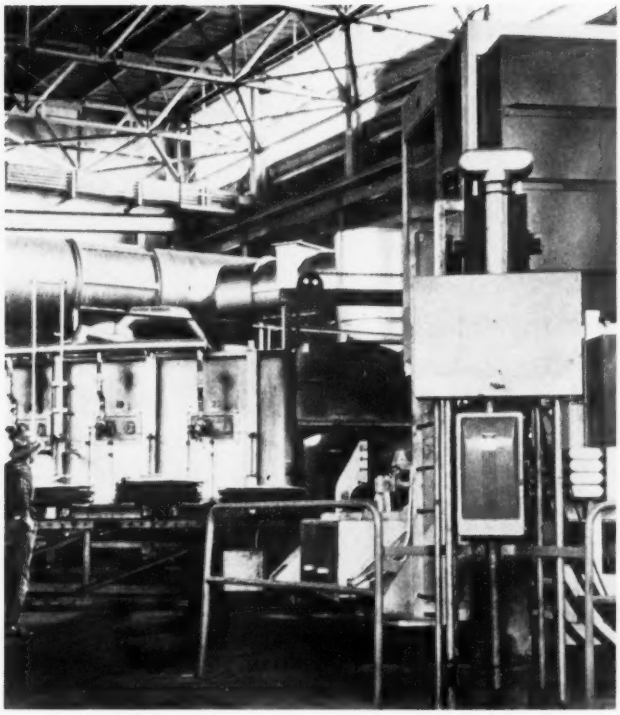
Competitive — The unit is installed in an area of high power cost (about 1 cent per kilowatt-hour) and reasonable fuel cost. Although such conditions are unfavorable for arc furnace installations, the unit is competitive in cost with the fuel-oil-fired reverberatory furnaces used in the industry.

For equal yearly production, says American Smelting, the capital cost of a large arc furnace and auxiliaries is less than that of multiple reverberatory installations and their auxiliaries. Also, the furnace turns out a smooth and continuous flow of uniformly high-quality copper of low sulfur content, which can be cast at convenient rates.

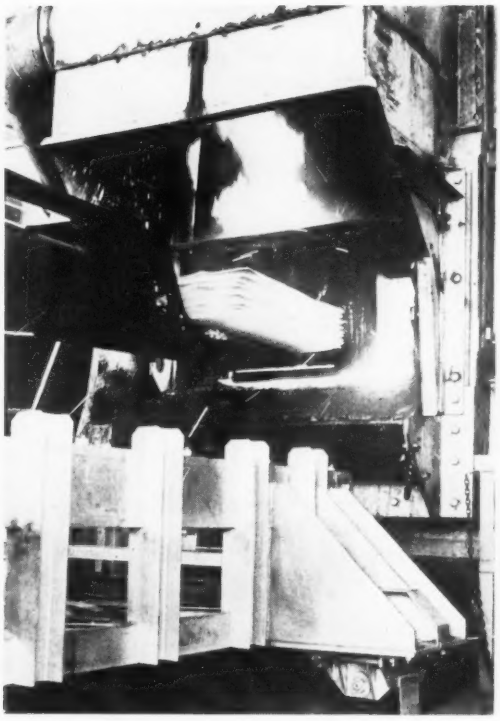
Auxiliaries—The installation combines an oil-fired preheating furnace with the electric arc unit to use both sources of heat at optimum efficiency. Cathode sheets of copper are heated to 1500-1600° F in a rotary preheating furnace. In addition to heating the copper with relatively inexpensive oil, this step permits a low sulfur feed to the arc furnace.

The heated, low sulfur cathodes are transferred to the arc unit where the copper is melted and heated to 2100-2150° F. The metal is poured at 2030° F, flowing continuously by displacement and by adjustment of the furnace tilt angle. From the furnace, the copper flows down a launder to a 10-ton electric holding furnace where its temperature and oxygen content are regulated prior to casting.

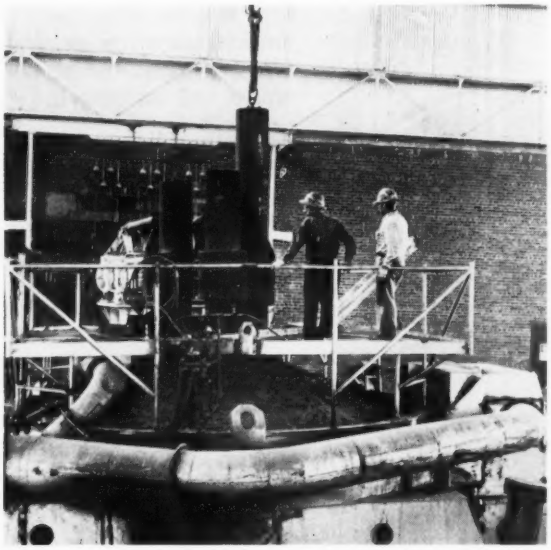
Electrode Control—The operation of an arc furnace to melt copper poses problems in electrode control. The arc discharges from the bottom of the electrodes to the bath and



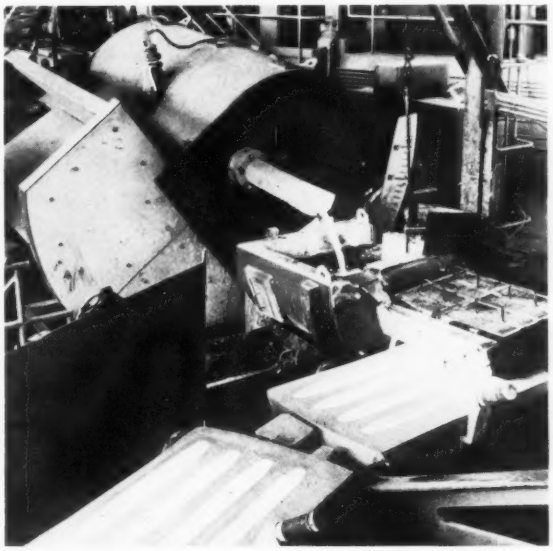
Sheets of copper are fed to the rotary preheating furnace by a charging machine. The oil-fired unit heats the sheets to 1600° F in a controlled atmosphere in about 1 hour



The hot sheets of copper are removed from the preheater and swung in front of the arc furnace door. Scale at left indicates tilt of furnace



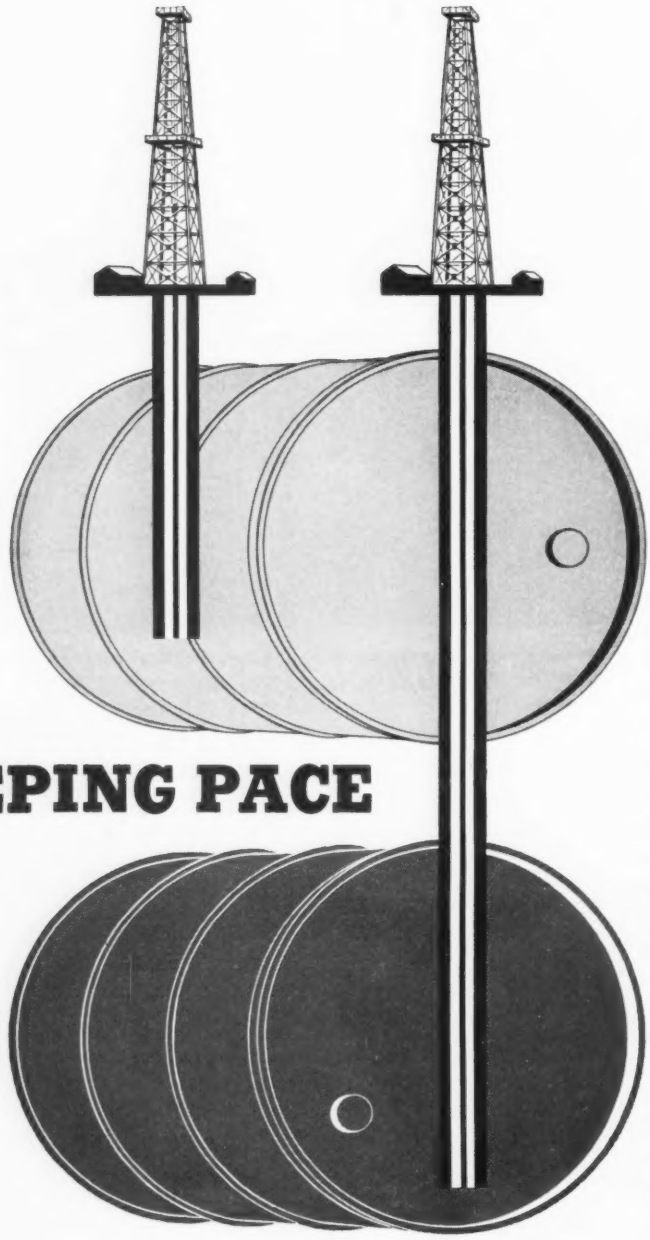
Generally one electrode per shift is consumed in the furnace; electrode sections must be added regularly



Molten copper runs down launder into induction furnace, then into pouring ladle from which molds are filled

requires that an air gap ½ to 1 in. be maintained at all times. Ripples caused by charging or surges in the bath require an extremely sensitive control system to permit the electrodes to adjust automatically to the constantly changing conditions at the metal surface. If the electrodes are lowered too far, a short circuit results; if they are withdrawn excessively, the arc is snuffed.

The combination of necessary sensitivity and rapid motion of the massive electrodes (each weighs 4000 lb when assembled) is obtained with a rotary regulator and controls actuating a hydraulic servosystem. Whiting Corp., Chicago, and General Electric Co., Schenectady, N. Y., designed the control system.



KEEPING PACE

Drills were chewing their way down for about 2000 feet in the search for oil in 1916. Today's drilling depth is more than double that.

The change in drilling that forty years has brought well symbolizes many advances in the petroleum and chemical industries. Engineers have dug more deeply into the secrets of nature, too . . . have designed plants and processes to wrest new products and services from petroleum, ores and elements.

We mentioned 1916 because that is the year Sun Ship was founded. It has long served the swift-growing needs of petroleum and chemical industries. Year by year, the engineering skill and facilities of the great Sun Ship plant have proven their ability to meet the demands for plant and equipment keyed to the swift pace of progress in these and other important fields. Sun Ship keeps pace with progress.

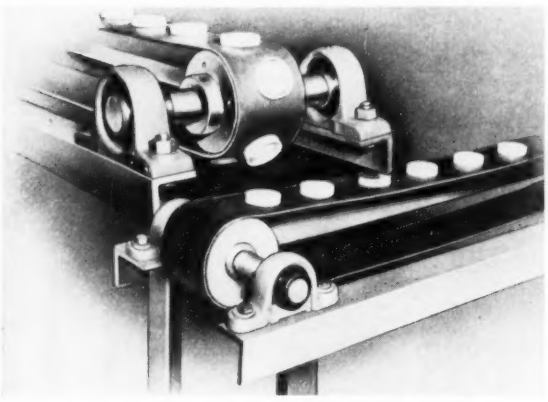
Sun

SHIPBUILDING & DRY DOCK COMPANY

SINCE 1916

ON THE DELAWARE • CHESTER, PA.

Magnetic Rolls Increase Versatility of Material Handling



Magna-Rolls are nonelectric flat-face rolls that provide the magnetic strength and depth of field required for a given application.

Diameters of the rolls range from 2½ to 30 in. They can be used as head or tail pulleys—for holding, controlling, or elevating ferrous parts, receptacles, boxed metal pieces, rods, bars, pipes, and steel sheets.

The rolls can be used in new or existing conveyor systems. Magnetic strength of the units is guaranteed indefinitely.

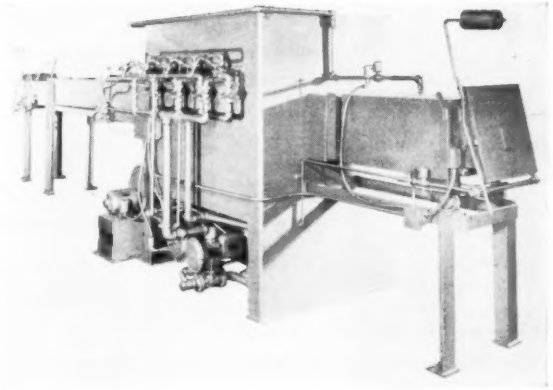
The rolls provide automatic pickups from one belt to another, reorient individual parts or containers, control the carryover of parts at the tops of inclined conveyors, and permit faster speeds and prevent damage due to slippage. *Write*: Eriez Mfg. Co., Erie, Pa. *Phone*: 4-0133

Furnace Heats and Cools Stainless and High Alloys

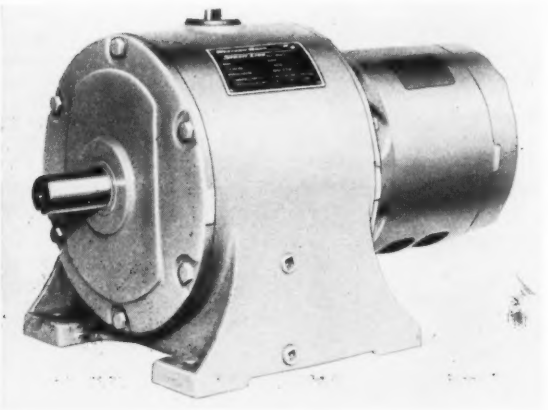
This full muffle, pusher type furnace is designed for bright brazing, annealing, and hardening of stainless, tool, and carbon steels without oxidation or discoloration. Is uses a hydrogen atmosphere.

Heating chambers measure up to 14 in. wide, 48 in. long, and 10 in. high. The work goes from the heating chamber into a water-jacketed cooling area. When it leaves the furnace, it is cool enough to touch, eliminating the possibility of oxidation.

Purge chambers at the entrance and exit of the system have flame-curtained doors. They are designed to insure freedom from contamination of the hydrogen atmosphere within the system. *Write*: Eclipse Fuel Engineering Co., 1100 Buchanan St., Rockford, Ill. *Phone*: 8-3751



Interchangeable Gear Motors Are Easy To Service



The StraitLine series of integral and all-motor gear motors ranges from 1 to 60 hp and from 9 to 520 rpm. Other speeds and horsepowers are available.

The gear sets and motor packages can be interchanged in the field without disconnecting the gear motor from its foundation or the driven shaft.

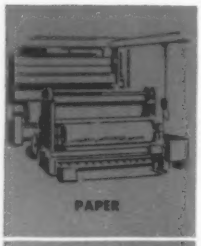
Ratios can be changed in the field, quickly and simply, when there is a change in output speed variation requirements.

The gear motors are easy to service because the gear housings can be reached from either end.

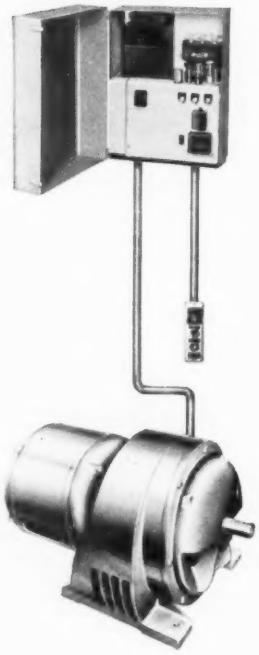
Users of the gear motors can maintain a flexible inventory because the "building block" system of parts standardization is used. *Write*: Western Gear Corp., P. O. Box 182, Lynwood, Calif. *Phone*: Newmark 8-7821

DYNAMATIC®

Eddy-Current and Solving Problems



If you want to Drive, Stop, Test—Control Speed, Torque, or Tension — Dynamatic Equipment will do it Better at Lower Cost!



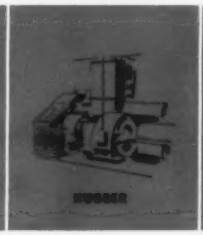
Dynamatic Eddy-Current Couplings, Drives, Brakes, and Dynamometers—

fulfill practically all stepless adjustable speed and testing equipment requirements, using standard alternating current as a power source. This Dynamatic torque transmitting equipment, with electronic or magnetic amplifier control, offers a long list of outstanding advantages: rapid response, wide speed range, quiet operation, low power loss, low maintenance cost, and remote control. There are types and sizes of Dynamatic Eddy-Current Equipment for every industrial requirement, including compact drive-package combinations *(illustrated at the right)*.

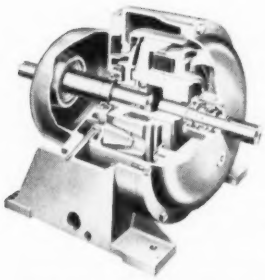
Dyna-torQ Magnetic-Friction Clutches, Brakes, Clutch-Brakes, and Clutch-Couplings—

provide the accurate trouble-free method of controlling power and motion in modern stop-and-go machines. Eaton Dyna-torQ units utilize a simple operating principle which provides instant response, shockless acceleration and deceleration. Superior construction means long operating life, minimum down-time, low maintenance cost. Outstanding advantages include rapid engagement and disengagement, self adjustment, lower operating temperature through effective cooling, simple accurate control. There is a wide range of sizes and capacities.

Send for Illustrated Literature Describing
Dynamatic Eddy-Current and Dyna-torQ Equipment



Magnetic-Friction Equipment is in Every Major Industry

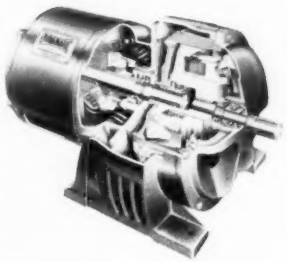


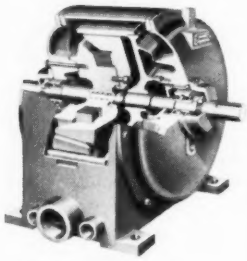
EDDY-CURRENT COUPLINGS

Dynamatic Eddy-Current Couplings transmit torque from driving to driven member without mechanical contact, shock, or friction. Controls provide infinitely adjustable speed from a constant speed source or constant speed from a variable speed source with smooth, controlled acceleration. Liquid-cooled and air-cooled types.

EDDY-CURRENT DRIVES

Dynamatic Eddy-Current Drives consist basically of an integral combination of an AC constant speed induction motor and an eddy-current coupling. Electronic or magnetic amplifier control provides accurate speed control for a wide range of applications. Available in liquid-cooled and air-cooled types.



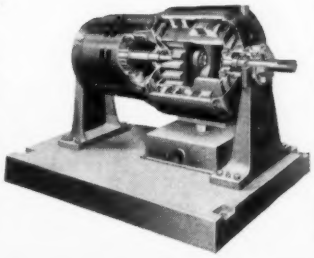


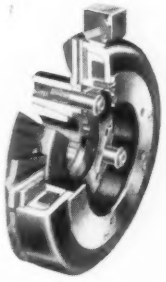
EDDY-CURRENT BRAKES

Dynamatic Eddy-Current Brakes are available in a wide range of torque capacities and operating speeds. Features include smooth, frictionless, shock-free operation with no rotating electrical components or contacts. Liquid-cooled and air-cooled types.

EDDY-CURRENT DYNAMOMETERS

Three types of Dynamatic Eddy-Current Dynamometers are available to meet various testing requirements; absorption dynamometers up to 15,000 HP; motoring or driving dynamometers up to 500 HP; and universal dynamometers to 500 HP and larger. Special purpose dynamometers are also available.



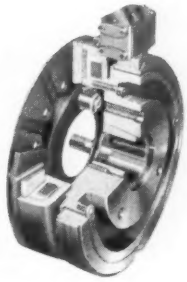


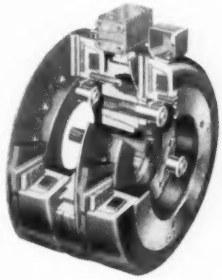
DYNA-TORQ BRAKES

Dyna-torQ Brakes provide controlled deceleration and positive stop with a touch of the control. Rapid, shockless stopping of rotating machine parts reduces interval between operations, and positive holding keeps them motionless between cycles. Compactness and remote control mounting conserve space.

DYNA-TORQ CLUTCHES

With the Dyna-torQ Clutch close control of clutch torque provides soft, cushioned starts, minimizing shock. Driving motors may be brought to operating speed before coupling to the load. Soft clutching permits controlled acceleration.



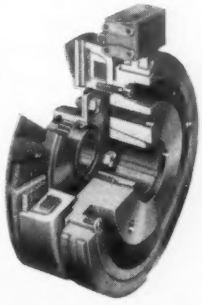


DYNA-TORQ CLUTCH-BRAKES

The Dyna-torQ Clutch-Brake provides closely controlled acceleration and deceleration. It is ideal for applications requiring automatic start-stop operation, eliminating time loss in slow-down between operations, and facilitating accurate automatic cycling.

DYNA-TORQ CLUTCH-COUPLINGS

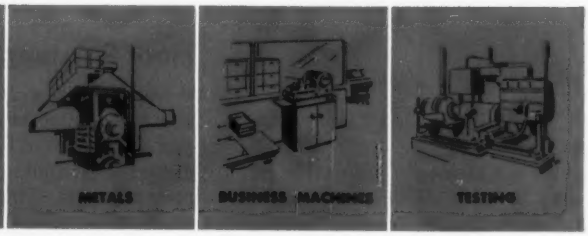
Compact, simple, Clutch-Coupling parts are installed on shaft ends in the same manner as the halves of a conventional flexible coupling. Designed for clutching of directly-aligned shafts, the Dyna-torQ Clutch-Coupling is easily installed on existing machinery or designed into new equipment.



DYNAMATIC DIVISION

EATON MANUFACTURING COMPANY

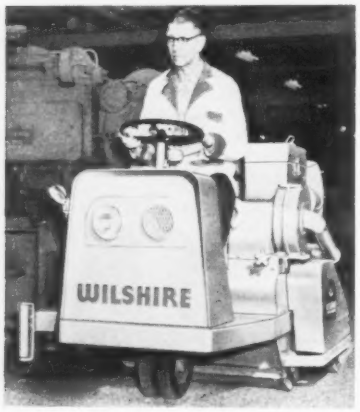
KENOSHA WISCONSIN



NEW PRODUCTS and equipment

Electric Sweeper

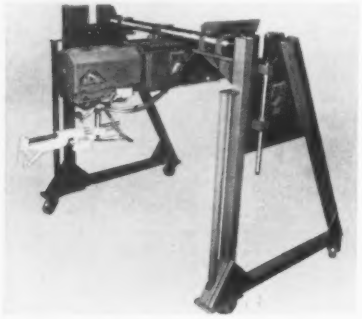
Electrisweeper, Model 2436, features automotive type shockproof steering, fingertip steering column control of hydraulics, foot-operated hydraulic brakes, and an electric forward and reverse without shifting gears.



This machine runs a full 8-hour shift on one battery charge. *Write*: Wilshire Power Sweeper Co., 247 Dundee Ave., Elgin, Ill. *Phone*: Sherwood 1-9111

Press Unloader

The 6000 Series, Horizontal Iron Hand has an over-all length of only 18 in. more than the stroke length. Models range in stroke length from 36 in. with speeds up to 40 strokes per minute. A geared nonslip belt which needs no lubrication is featured.



The unloader may be mounted on the press upright, on a conveyor, or on a universally adjustable roll-away base. With the jaw removed, it can always be used as a power unit to feed parts or as a transfer mechanism.

Other features are a universally adjustable jaw, which can grab at any angle, and permanently sealed bearings. *Write*: Sahlin Engineering Co. Inc., P. O. Box 289, Birmingham, Mich. *Phone*: Midwest 4-7373

Plating Barrel

This Lucite cylinder is used with Model C and E automatic barrel plating and processing machines. It has an offset bottom that mixes work better and boosts the number of different parts that can be plated in a barrel machine.

Strength is increased by a heavy rib which goes completely across the bottom of the barrel. It prevents heat distortion.

Platisol covered steel bales are mounted between Lucite guides. This means added strength and life as the driving force that rotates the barrel is spread over the entire area.

Lucite studs hold the barrel to the bale. Plating is more uniform because there are more holes per square inch of barrel surface. *Write*: Frederic B. Stevens Inc., 1800 18th St., Detroit 16, Mich. *Phone*: Tashmoo 5-0725

Floor Patching

Emeri-Quikpatch is a wear-resistant, nonresilient material for patching concrete floors without the danger of softening, rutting out, or poor adhesion. The emery-base material also eliminates absorbency. It cures and becomes serviceable overnight.

The material comes in 105-lb fiber drums. Only water is added to it. *Write*: Walter Maguire Co. Inc., 60 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 7-9086

Dust Control

This hot gas washer is used with melting furnaces and other operations where hot air or gases present a dust pollution problem. It resists temperatures up to 2000° F. The unit is less than 15 ft high.

Fine water sprays cool the gases and wet the particles at the inlet connection. Centrifugal force causes the wetted particles to impinge on the wetted surface of the primary separation chamber. The particles flow down to be entrapped in the turbulent waters of the settling tank where they are precipitated to the bottom.

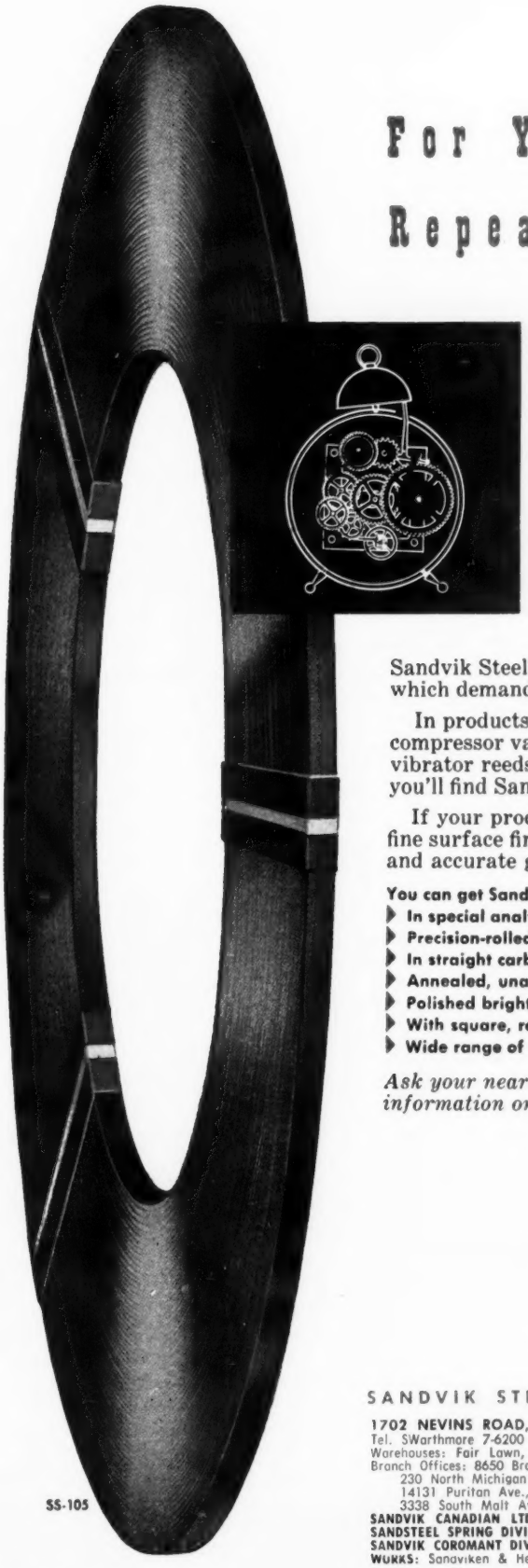
From the primary chamber, gases flow into the induced draft fan chamber where dynamic action impinges the particles on the wetted surface. These particles also flow down, are entrapped, and precipitated to the bottom of the tank.

Washer units are available with manual or automatic sludge removal. *Write*: Lehigh Fan & Blower Div., Fuller Co., Catasauqua, Pa.

Stamp Holders

The N-Dur-All holders are used for production marking of steel and nonferrous plates, pipes, and tubing.

An impact resistant, rubber body is molded to the brass or aluminum base. The stamps are held in position by special spring plunger re-



SS-105

For Years of Repeat Performance

specify SANDVIK SPRING STEEL

Sandvik Steels have a record of success in applications which demand years of consistent, continuous performance.

In products such as clock and watch springs, compressor valves, piston ring springs, vibrator reeds . . . wherever fatigue life is *vital*, you'll find Sandvik untiring in service.

If your product requires high fatigue life, fine surface finish, uniform physical properties and accurate gauge, try Sandvik.

You can get Sandvik strip steels:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- **Wide range of sizes in stock—also slitting facilities available.**

Ask your nearest Sandvik office for further information or technical assistance.

SANDVIK SWEDISH SPECIALTY STRIP STEELS

are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical, etc. • Razor Blades • Shock Absorbers • A Wide Variety of Springs • Trowels • Reeds: Vibrator, Textile, etc., • Piston Ring Segment and Expanders • and many other applications

SANDVIK STEEL, INC.

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Warehouses: Fair Lawn, N. J. • Cleveland • Los Angeles
Branch Offices: 8650 Brookpark Rd., Cleveland 29, O.—ONtario 1-3205
230 North Michigan Ave., Chicago 1, Ill.—FRanklin 2-5638
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SANDVIK CANADIAN LTD.—P. O. Drawer 1330, Station O, Montreal 9, P.Q.
SANDSTEEL SPRING DIVISION • Fair Lawn, N. J. • Industrial Springs
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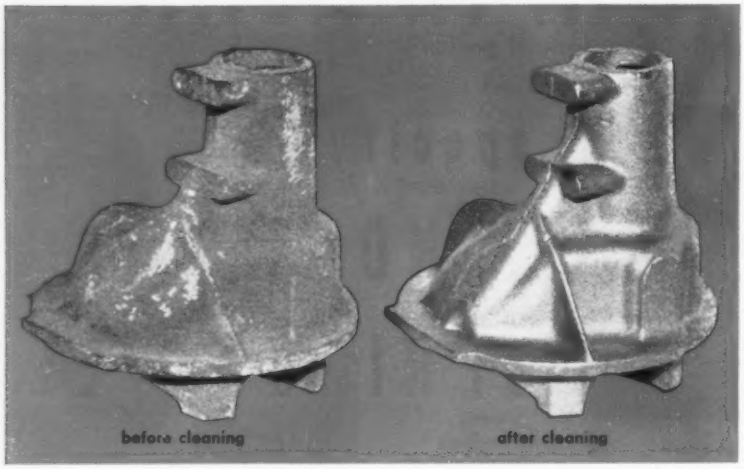
WORKS: Sanaviken & Hellefors, Sweden

Sandvik Quality Steels

WHEELABRATOR® STEEL SHOT

cuts abrasive costs for

ALL TYPES OF FOUNDRIES



Malleable Foundry Saves $12,000 Annually

Cuts Abrasive Consumption in half

Savings of $1,000.00 a month in abrasive cost are being made at Albion Malleable Iron Co., as a result of switching from a malleable type abrasive to Wheelabrator steel shot.

This high production foundry operates a battery of 8 Wheelabrator Tumblasts, cleaning a wide variety of castings. Consumption of the malleable shot in these machines was at the rate of 20 tons a month. Since changing to Wheelabrator Steel Shot this has been decreased to 110 tons a month, for an annual saving of $12,000.00 on abrasive alone.

More than 1200 firms have standardized on Wheelabrator Steel Shot and are recording inpressive savings. Consistently harder, with greater resistance to breakdown, it lasts longer in use, cleans better, and reduces total cleaning costs.

Write today for Bulletin 89-B — free — for detailed information on Wheelabrator Steel Shot

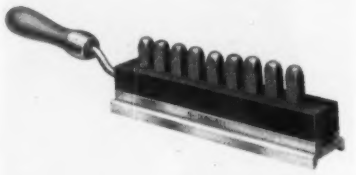
WHEELABRATOR CORPORATION

509 South Byrkit Street **Mishawaka, Indiana**

Canadian Offices: Scarborough (Toronto) — Montreal

NEW PRODUCTS and equipment

tainer screws on one side. Models for marking pipes or tubing have a modified base for positioning on the round shape.



Holders are produced to accommodate any number of steel letters or figures in one, two, or three rows. Holders for stamping tensile, grade, and company identification are also available. *Write*: M. E. Cunningham Co., 1038 Chateau St., Pittsburgh 33, Pa. *Phone*: Allegheny 1-3280

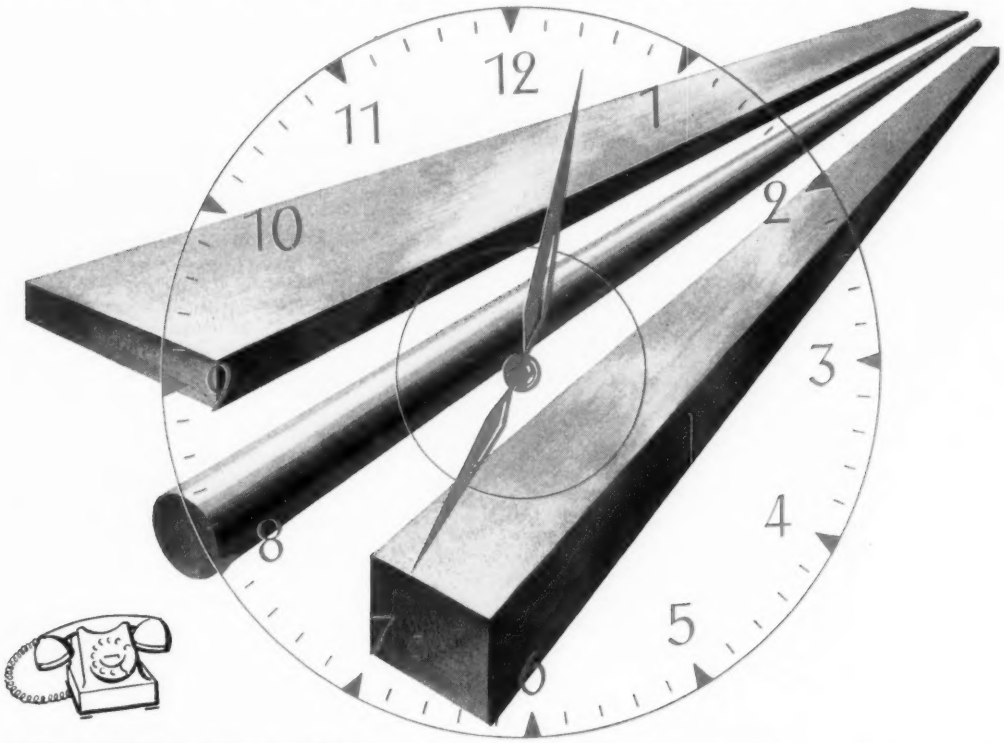
Shell Core Blower

The Series 300-H shell core blower is a manually operated, two station, shuttle type machine for making a variety of 10 to 25 lb cores on each end. Each station accommodates core boxes up to 4⅛ in. in depth, 10 in. wide, and 15 in. long.

This self-feeder has a capacity of 200 lb of phenolic resin coated sand. Only two valves are required. Each station has center pivoted roll-over action and each heater vise is lever and cam controlled for positive sealing of molds during curing. The machine needs only 40 x 66½ in. floor space. *Write*: Harrison Machine Co., Wesleyville, Erie, Pa. *Phone*: 8-3805

Firth Sterling ...

PIONEER IN POWDER AND MOLTEN METALLURGY



HOW FAST do you need the toughest oil-hardening tool and die steel ever made?

INVARO is available—for fast delivery—from Firth Sterling warehouse and distributor stocks of drill rod and ground flat stocks in all practical sizes. It offers tool and die makers consistent uniformity, better hardenability and greater safety in hardening—does a better job in a broad range of applications.

And the INVARO "Twins"—ground flat stock and drill rod—may be heat treated in the same furnace at the same time, exhibiting the same minimum dimensional changes. The resulting savings in time and production can be substantial. For further information, write for free technical bulletin.

INVARO oil-hardening tool and die steel is just one of the many types of electric furnace quality tool steels produced by Firth Sterling. These high quality tool steels are the result of Firth Sterling's continued research and development to provide specialty steels for use in the important tool and die industry.

* * *

If you have a metallurgical problem, powder or molten, we have the answer for it. Please let us hear from you. Firth Sterling, Inc., Dept. 81B, 3113 Forbes St., Pittsburgh 30, Pa. Offices and warehouses in principal cities.

PRODUCTS OF Firth Sterling METALLURGY

HIGH SPEED STEELS • TOOL & DIE STEELS • STAINLESS SPECIALTIES • HIGH TEMPERATURE ALLOYS
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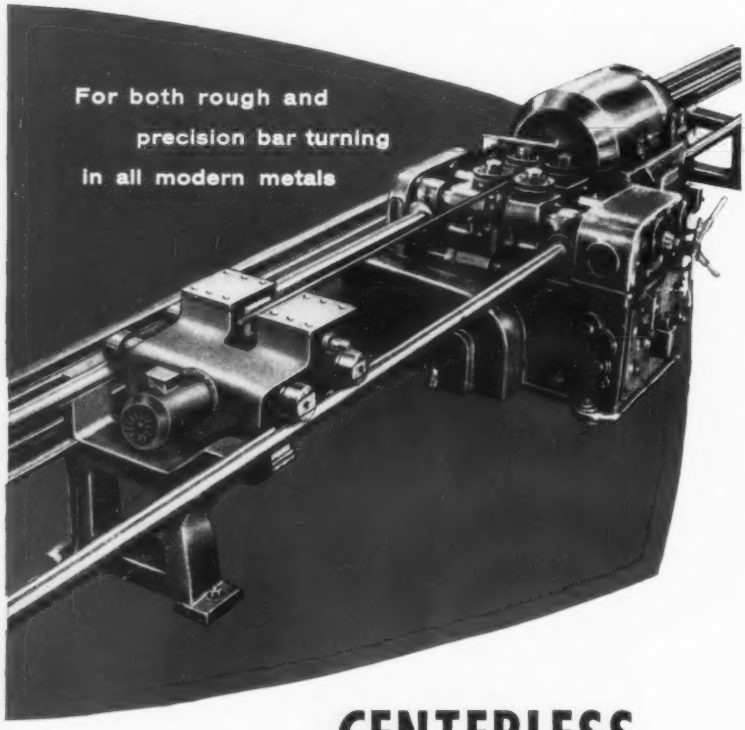
FIRTH STERLING TRADE MARK

SUTTON presents outstanding

FARMER-NORTON Finishing Machines

Under license from Sir James Farmer Norton & Co., Ltd.



CENTERLESS BAR TURNING MACHINES

Now—U.S. plants can have automatic straight-line bar turning with the finish comparable to the finish of centerless grinding! Machines are fitted with a wide variation of feeds for either rough or precision turning. Ovality tolerances of plus or minus .00025" and a diameter variation better than plus or minus .001" in any 20' length, are achieved for precision turned bars with these machines.

Ask for complete data

Also available:

- Silent-Running Swaging Machines
- 2-Roll Straighteners and Polishers
- Strip Flattening & Cutting Machines

SUTTON *Engineering Company*

FIRST NATIONAL BANK BLDG., PITTSBURGH 22, PA.
PHONE: GRANT 1-8077 PLANT: BELLEFONTE, PA.

Manufacturers of Straighteners, Hydraulic Extrusion Presses, Centerless Bar Turners, Rotary Swagers, Sheet Levellers and other Finishing Machines for Modern Metals.

NEW literature

Write directly to the company for a copy

Lathes

Bulletin 1506, 32 pages, describes 12 lathes that provide automatic spindle speed calculation and preselection of speeds. They're for toolroom or production use. Monarch Machine Tool Co., Sidney, Ohio.

Quick Coupler

Bulletin F-10-R, 8 pages, describes couplers for hoses, piping, and equipment. Jordan Industrial Sales Div., OPW Corp., 6013 Wiehe Rd., Cincinnati 13, Ohio.

Pump Motors

Totally protected motors from 1/8 to 1000 hp are described in Bulletin B-2507, 4 pages. Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

Barrel Finishing

This 24-page bulletin describes the grinding, deburring, polishing, and coloring of metal parts. Recommended workloads and descriptions of the machines are included. Roto-Finish Co., 3700 Milham Rd., P. O. Box 988, Kalamazoo, Mich.

Worm Gearing

Bulletin CD-575, 8 pages, tells how to assemble cone drive, double enveloping gears. Cone-Drive Gears Div., Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.

Alloy Iron Castings

Properties of Ni-Hard, a nickel-chromium, white cast iron with high abrasion resistance, are described in Bulletin 263, 16 pages. Nordberg Mfg. Co., Milwaukee 1, Wis.

Lithium

The metal's properties, its uses, and producers are listed in this 24-page bulletin. Other alkali metals, cesium and rubidium, are also covered. Montgary Explorations Ltd., Toronto, Ont.

Vacuum Metalizing

The process and equipment for depositing a thin metallic film on any base material by evaporation and condensation under high vacuum conditions are described in Catalog 780, 24 pages. Vacuum Equipment Div., F. J. Stokes Corp., 5500 Tabor Rd., Philadelphia 20, Pa.

Fork Truck

Bulletin 37, 6 pages, describes the maneuverability of an electric truck with a rear-wheel drive and a mast recessed between the load wheels. Dept. R8-1, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass.

Optical Tooling

An instrument used in checking squareness of surfaces and in testing surface flatness of machine beds, angles, parallelism, and straightness is described in a 4-

NEW LITERATURE . . .

page bulletin. It reads to 1 second of arc. George Scherr Co. Inc., 200 Lafayette St., New York 12, N. Y.

Roof Ventilators

This selection guide, Bulletin 2301, 8 pages, covers a line of exhaust and supply power ventilators with low silhouettes. Ilg Electric Ventilating Co., 2850 N. Pulaski Rd., Chicago 41, Ill.

Ductile Iron

This 18-page bulletin uses case histories to show how strength and toughness can be cast in tiny levers and huge engine frames. Reader Service Section, International Nickel Co. Inc., 67 Wall St., New York 5, N. Y.

Hydraulic Tables

Information for hydraulic engineers and designers is contained in Bulletin 3300, 40 pages. Included are conversion tables, hydraulic ram capacities, wire and sheet metal gages, steel pipe tables, bolt tables, specific gravities, and strengths of materials. Data are provided on fluid losses, properties of metal sections, beam formulas, methods of finding moments of inertia, deflection curves for springs, and hardness conversion tables. Presses for die hobbing, preforming, and metal-powder compacting are described. Hydraulic & Compacting Press, Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, Ohio.

Gear Catalog

Here is information on stock gears, speed reducers, sprockets and chains, flexible couplings, universal joints, collars, and pillow blocks. Catalog 100, 80 pages, includes charts for the selection of speed reducers and stock gears. Only input speed, ratio, and horsepower or torque are needed to find the best drive. Gear Div., Charles Bond Co., 617-23 Arch St., Philadelphia 6, Pa.

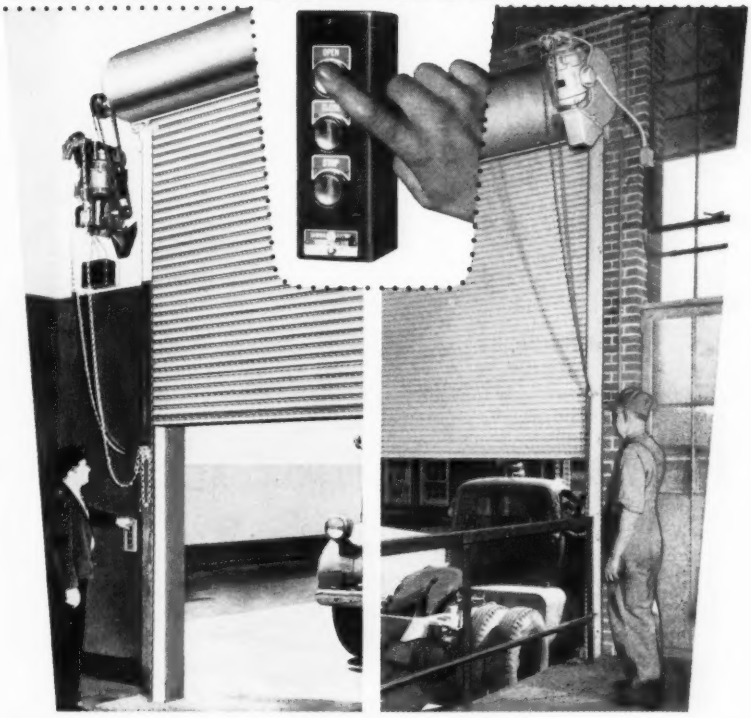
Internal Threading

This 4-page bulletin describes taps that roll threads (deform longitudinal fibers) rather than cut them. Besly-Welles Corp., South Beloit, Ill.

Liquid Rheostats

Bulletin GEA-6664, 8 pages, discusses the use of liquid rheostats in providing stepless secondary control of high horsepower, wound rotor motors. Bulletin GET-2740, 8 pages, is more technical. It describes operating characteristics of the rheostats in various applications, provides perform-

For Better CONTROL of Costs



Kinnear Motor-Operated Steel Rolling Doors

A proved way to "put the finger" on unnecessary costs is to install Kinnear Motor Operated Rolling Doors. Combining quick, easy push-button control with highly efficient *coiling upward action*, they save time, steps, effort and space.

For example, you never have to make sure all's clear before you touch the button to *open* Kinnear Doors. They coil upward without using a single extra inch of floor, wall or ceiling space.

Push-button control promotes prompt closing of opened doors — saves heated air in winter and cooled air in summer.

You save floor, wall, and ceiling space — all fully usable for storage or equipment at all times.

You avoid traffic bottlenecks. You can control any number of doors from *one* point, or *each* door from any number of additional remote locations.

And no other doors can match Kinnear's 60-year record for long, dependable, low-maintenance service under hard, daily use.

In addition, the famous interlocking steel-slat curtain *(originated by Kinnear)* gives you extra protection against wind, weather, fire, intrusion and vandalism.

To lower door costs (as well as costs *due to doors*) in these and other ways, get the full story on Kinnear Rolling Doors. Built to fit any opening, in new or old buildings. Write today.

The KINNEAR Manufacturing Company

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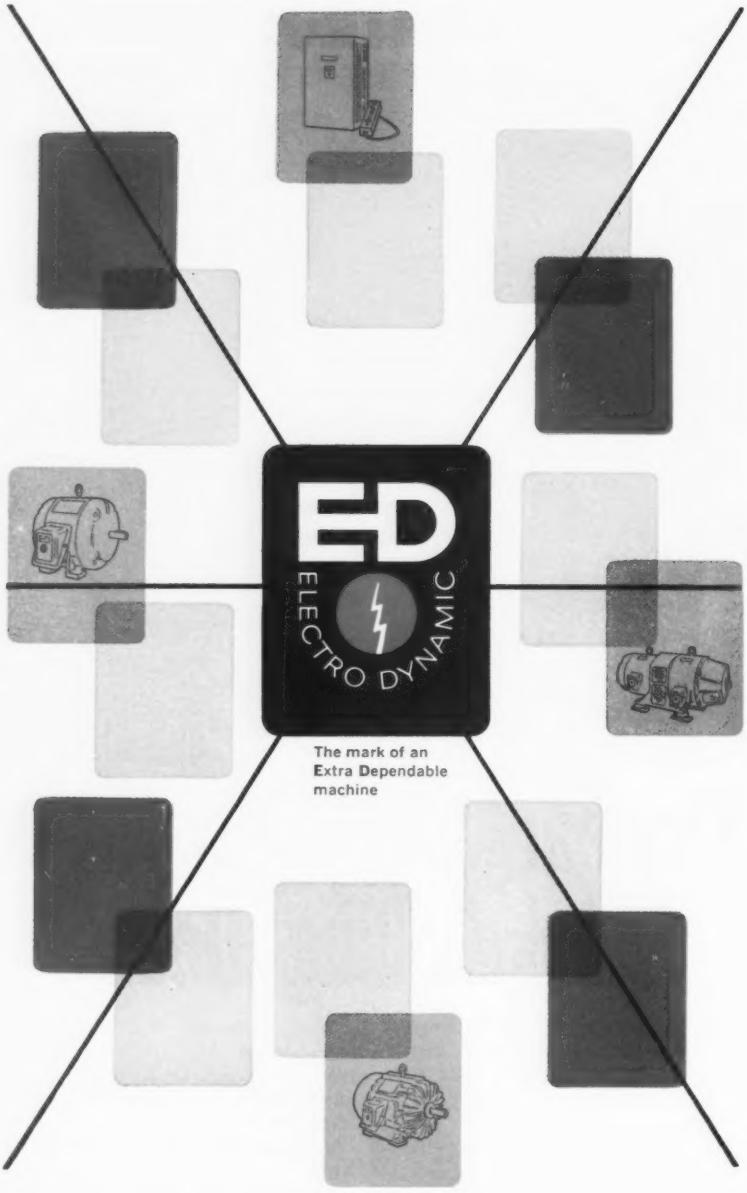


What this symbol means

Like the brand name on other quality products you buy, the E.D. symbol on your electric motors means "The Best".

You know also that there is an E.D. expert nearby whenever you need him. Electro Dynamic's broad network of offices includes a chain of over 25 warehouses set up across the country to provide utmost speed of delivery to you.

Complete line of a.c. and d.c. motors from 1 to 300 h.p., Geared Motors, Selectrol and Selectron Variable Speed Drives and Motor Generator sets.

Telephone or write for Bulletin 50-A.

ELECTRO DYNAMIC
DIVISION OF GENERAL DYNAMICS
CORPORATION
BAYONNE, NEW JERSEY

NEW LITERATURE . . .

ance curves, and discusses design of the units. General Electric Co., Schenectady 5, N. Y.

V-Belts

Bulletin S-51107, 16 pages, describes the testing, inspection, and control of the quality of V-belts. Dept. 794, Goodyear Tire & Rubber Co., Akron 16, Ohio.

Carbide Tools

Catalog 12 describes a line of carbide cutting tools with microfinish. Dixie Tool Industries, 4555 W. Franklin Ave., Bridgeport, Mich.

Strapping Systems

Hand tools and machines used in steel strapping are described in this 12-page bulletin. Stanley Steel Strapping, division of Stanley Works, New Britain, Conn.

Refractories

Ladle linings, sleeves, nozzles, bottom pour brick, and refractory hot tops for steel mills are described in a 4-page bulletin. Refractories Div., H. K. Porter Company Inc., 2500 First National Bank Bldg., Pittsburgh 22, Pa.

Saw Blades

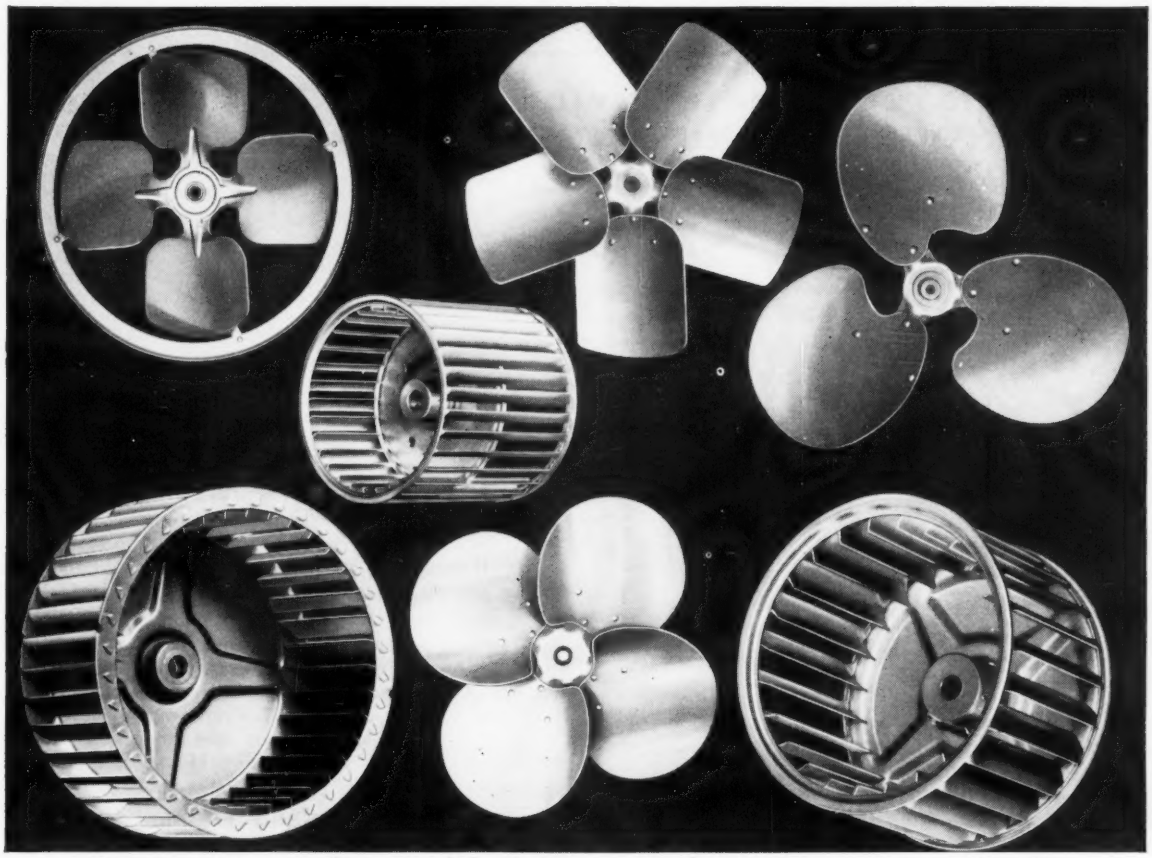
A wall chart aids in the selection of blades for band sawing. It lists the sawing factors that affect cutting rate, tool life, and finish. Recommended cutting rates and lubricants are given. DoAll Co., Des Plaines, Ill.

NEW BOOKS

A Perspective of Molybdenum-Base Alloys, Alvin J. Herzig, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $1.50.
This Gillett Memorial Lecture contains technical information on metals that can withstand high temperatures and yet maintain physical strength.

Hot Dip Galvanizing 1956, Zinc Development Association, 34 Berkley Square, London W. 1, England. 232 pages, 45s ($6.30).
Papers and edited discussions of the Fourth International Conference on hot dip galvanizing are presented in this book. Topics include galvanizing practice; galvanizing pot construction; heating baths; the galvanizing of angles, castings, and wire; painting; and new markets.

Iron Ore Beneficiation, Lawrence A. Roe, Minerals Publishing Co., Box 85, Lake Bluff, Ill. 305 pages, $5.
This reference covers sources and economics of iron ore, iron ore minerals, heavy-media separation processes, flotation, magnetic separation, pyrometallurgical processing, hydrometallurgy and byproducts, agglomeration, and the use of research.

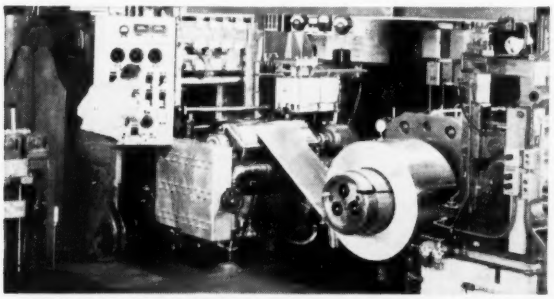


A FEW OF THE MANY air impeller units made by The Torrington Manufacturing Company, Torrington, Conn. Fan blades are fabricated from Anaconda Aluminum Coiled Sheet Alloy 3003. Blower wheels use Alloys 5050 and 5052.

Uniformity of Anaconda Aluminum Coiled Sheet helps Torrington maintain high quality in air impellers

The Torrington Manufacturing Co. is a leading supplier of air impellers to the air conditioning, heating, and ventilating industries. Its products range from blade assemblies for window fans to blower units for big Air Force bombers.

For products fabricated from aluminum, the company has turned to Anaconda Aluminum Coiled Sheet and has found that the uniformity of metal in shipment after shipment has made it easier to maintain the high quality standards established for its air impellers.



AVAILABLE FOR PROMPT SHIPMENT TO ALL POINTS IN THE U. S.
Anaconda Aluminum Coiled Sheet in gages from 0.003" to 0.064" and in widths from ¾" to 28"; coils up to 100 pounds per inch of width, in alloys: 1100, 3003, 3004, 5005, 5050, 5052.

The Torrington Manufacturing Co. stamps components from large coils of aluminum sheet. Fans range from 1½" to 30" diameter; blower wheels, from 1½" to 15" diameter.

ALUMINUM COILED SHEET

Anaconda Aluminum Coiled Sheet, produced to the high standards of quality and uniformity maintained by The American Brass Co., is now available for prompt shipment from our Torrington Division to all points in the United States.

It is rolled on the most modern, high-speed equipment, X-ray controlled to close tolerance in gage. High-speed, electronically operated slitters give exact widths with clean edges on evenly and tightly wound coils. Latest type annealing furnaces – with controlled atmosphere and temperature – provide high uniformity of metal structure to meet specified mechanical-property limits.

FOR IMMEDIATE ACTION

Contact The American Brass Company's District Sales Office nearest you or The American Brass Company, Torrington Division, Torrington, Conn. 5792

ANACONDA®
ALUMINUM COILED SHEET
Made by The American Brass Company

J&L

RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL

for Spring Steel Requirements such as these . . .

FORMED PARTS FOR HEAT TREATMENT

SIZE	8 x .038
ANALYSIS	1050
FINISH	Bright
HARDNESS	Rockwell B-78 Max.
THICKNESS TOLERANCE	± .0003 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Uniform spheroids
COIL SIZE	16" I.D. coils large as possible
PACKAGING	On skids — shrouded

FLAT PARTS FOR HIGH STRENGTH WITHOUT HEAT TREATMENT

SIZE	10 x .020
ANALYSIS	1075
FINISH	Bright
HARDNESS	Rockwell C-30 Min.
THICKNESS TOLERANCE	± .001 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Small-fine carbides
COIL SIZE	16" — I.D. Max. coil wt. 1000#
PACKAGING	On skids — shrouded

Knowing exactly what you require for most efficient fabrication and most effective product performance, J&L can set up and consistently meet restricted specifications to match your most exacting demands. Often production operations can be greatly simplified or even eliminated; in most instances end-product and/or assembly costs can be reduced and quite frequently, product quality improved.

We would welcome an opportunity to explore with you the possibilities of J&L Restricted Specifications applied to your strip steel requirements.

THE **4** IN **1** SOURCE FOR YOUR

COLD ROLLED STRIP STEEL

Now there are four J&L plants with facilities for production of "Restricted Specification" cold rolled strip. Strategic locations at Youngstown, Indianapolis, Los Angeles and Kenilworth, N. J., provide the security of 4 sources of supply plus the close working relationship which these local production centers make possible.

SIZE	14 x .040
ANALYSIS	1095
FINISH	Bright
HARDNESS	95 to 105 Rockwell B suitable for blanking
THICKNESS TOLERANCE	± .0005 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Uniform medium size spheroids
COIL SIZE	16" — I.D. Max. coil wt. 900#
PACKAGING	On skids — shrouded

Jones & Laughlin
STEEL CORPORATION
STRIP STEEL DIVISION
GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN • INDIANAPOLIS • LOS ANGELES • KENILWORTH, NEW JERSEY
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FORMERLY THE COLD METAL PRODUCTS COMPANY

STEEL

Market Outlook

"IT MAY SEEM incredible that the rather drastic changes of the past few months can be caused by so simple a thing as a general shift in inventory policy," observes a steel company economist.

How a decision to reduce inventories can compound the ill effects of a business decline is shown by this example: Suppose XYZ Inc. has 3000 lb of a certain mill product on hand. Using 1000 lb a month, it has a three-month inventory. To maintain its stock, it buys 1000 lb a month. Now suppose business drops off 20 per cent and consumption falls to 800 lb a month. Each month the firm will buy 800 lb instead of 1000. That doesn't sound too bad.

But suppose the company is pressed for money and decides to keep two months' inventory instead of three. It will immediately cut back from 3000 lb (three months at 1000 lb a month) to 1600 lb (two months at 800 lb a month). It will ship 1400 lb before ordering anything, and its supplier will get no business for almost two months.

PRODUCTION SLIDES—That's one explanation for the deep decline in steelmaking operations—a temporary suspension of buying by many consumers. During the week ended Feb. 9, furnaces operated at 54 per cent of capacity, producing about 1,450,000 net tons of steel. Corresponding figures for the previous week were 54.1 per cent and 1,459,000 tons. During the like week a year ago, production was 2,485,000 tons.

SEEDS OF RECOVERY—If drastic changes in inventory policy can bring a sudden recession to metalworking, they can also bring sudden recovery. Once consumers have decided that all's well with the economy, they'll start to buy. If orders picked up, fabricators would regain confidence. Anticipating bigger sales, thousands of XYZ companies would switch their two-month inventories back to three months. Orders for mill products would rise sharply, and the recovery would be on.

WAREHOUSES LOADED—Distributors began 1958 with record inventories of industrial steel products, reports the American Steel Warehouse Association, Cleveland. During 1957, they increased their stocks from 2.9 million to 3.7 million tons. Current inventories of plates, shapes, bars, and alloy steels are on the high side.

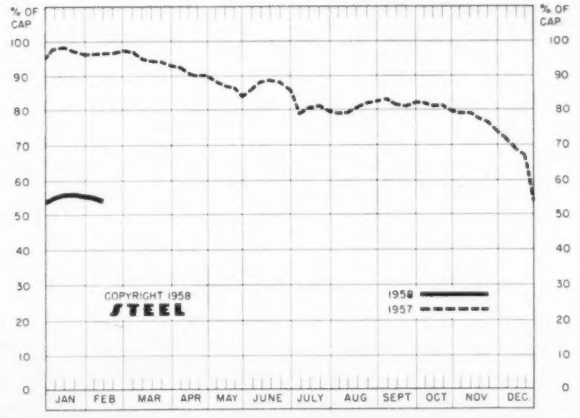
DETROIT HEDGES—Automotive steel buying is aimed primarily at inventory control. February orders are being held for March, just as January orders were pushed back to February. Wheel and body makers are trying to hold flat rolled inventories to 15 days. Local mills indicate that automakers may return to the market in April, but there hasn't been a spring upturn in auto sales in two years.

TUBULAR PICKUP?—Inventory liquidation by oil country tubular goods users should be completed by the end of March, says a producer.

PRICE CUTS—Several producers of stainless steel sheets and cold rolled strip have reduced prices about 1 per cent on Types 304 and 316 to bring quotations in line with other companies.

SCRAP EDGES HIGHER—Running counter to the production trend, scrap prices moved upward rather sharply last week. STEEL's composite on No. 1 heavy melting rose $1.83 to $37.33.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Feb. 9	Change	Same 1957	Same Week 1956
Pittsburgh	59	+ 2*	99	103
Chicago	58.5	+ 2*	96	99.5
Mid-Atlantic	75	+ 1	98	101
Youngstown	52	— 2	102	98
Wheeling	57	+ 2	100.5	100.5
Cleveland	34.5	— 3.5	98	100
Buffalo	51.5	— 2	107.5	105
Birmingham	52.5	— 0.5	94.5	95.5
New England	50	— 2	74	88
Cincinnati	41.5	—13.5*	87	98.5
St. Louis	76	+ 2	99.5	90
Detroit	52.5	+ 2*	101.5	99
Western	68	— 3	103	107
National Rate	54	— 1	97	99

INGOT PRODUCTION‡

	Week Ended Feb. 9	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	90.5†	90.8	94.3	154.7
NET TONS (In thousands)	1,454†	1,459	1,515	2,485

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

Metalworking Outlook—Page 37 Technical Outlook—Page 77

There IS a Big Difference in Saw Blade

Try DoALL *CLAW-TOOTH* on Your Next Job!

How the CLAW-TOOTH blade reduces contour or cut-off *sawing costs* . . .

CUTS ALL MATERIALS—Steel, titanium, brass, iron, asbestos, plastics, wood, rubber and many other metals and non-metallics.

EXTRA FAST CUTTING—The claw-like, positive rake angle teeth literally "pull themselves" into the work—providing more penetrating power and smoother chip flow.

EXTRA LONG LIFE—Made sharp to *stay* sharp—scientifically designed tooth and gullet shape gives you longer blade life. Teeth are securely anchored to the flexible back to take heavy cutting loads without breakage.

EXTRA EASY CUTTING—Its "bite-in" cutting efficiency requires less feed pressure, resulting in more output with less work per operator.

ACCURACY OF SET ± .002"—Only DoALL *guarantees* this set accuracy. It means you get straight, accurate cutting of virtually any material . . . freedom from binding . . . ability to produce a predetermined kerf size and surface finish.

CLEAN, BURRLESS CUTTING—Means less finishing and grinding costs.

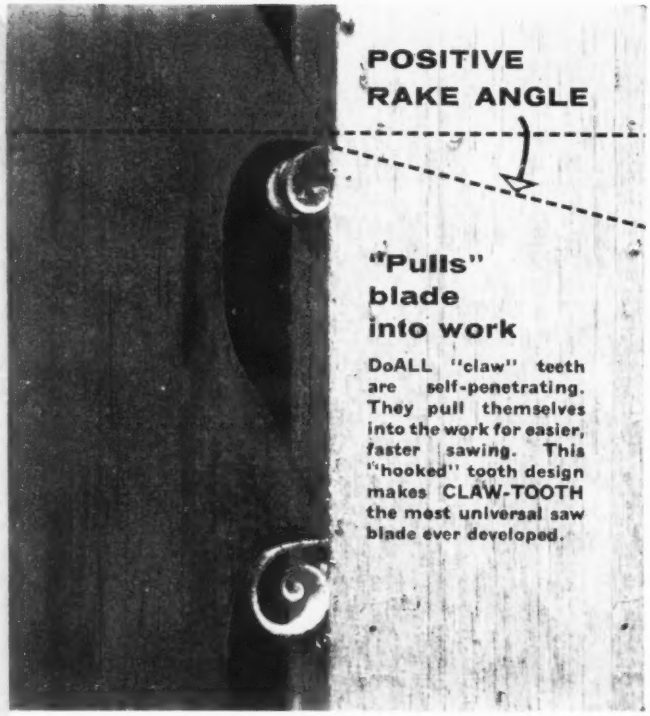
GUARANTEED UNCONDITIONALLY—to be completely free of defects in material, workmanship, heat treating and packaging.

Convenient "strip-out" Containers —

100′ or 500′ coils in exclusive DoALL "strip-out" boxes for convenience, safety and blade protection.

Custom Welded Lengths —

to fit any band sawing machine. Individual packages or cartons of six packaged blades.


POSITIVE RAKE ANGLE
"Pulls" blade into work
DoALL "claw" teeth are self-penetrating. They pull themselves into the work for easier, faster sawing. This "hooked" tooth design makes CLAW-TOOTH the most universal saw blade ever developed.

Available in CARBON or HIGH-SPEED STEEI

They'll saw faster on any machine!

There's a DoALL saw band for every machine and job . . . but the blade that handles *more* jobs *better* is the CLAW-TOOTH! For cut-off jobs or contour sawing, the versatile CLAW-TOOTH blade can reduce both your sawing costs and blade inventory.

Available in ¼" to 1" blade width—2, 3, 4, and 6-pitch. For lowest cost per square inch of cutting, specify DoALL CLAW-TOOTH. Or, if you have a special sawing problem, ask about DoALL's free blade selection service—complete recommendations will be furnished for your job.

Call DoALL locally for details, or send for FREE catalog listing complete line of DoALL band tools.

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MACHINE TOOLS ..... CUTTING TOOLS ..... MEASURING INSTRUMENTS ..... SHOP SUPPLIES IN STOCK

Broadens Product Line

Pittsburgh Coke & Chemical Co. starts producing ferromanganese and spiegeleisen, raw materials for steel plants and ferrous foundries, at Neville Island, Pittsburgh

STEEL PLANTS and ferrous foundries have a new source of ferromanganese and spiegeleisen. It's the Pittsburgh Coke & Chemical Co., Pittsburgh.

Ferromanganese is the metallic form in which manganese is used. About 15 lb of ferromanganese is consumed for every ton of steel produced. It serves as a cleansing and alloying agent.

The predominant manganese alloy used in making steel is standard high carbon ferromanganese (it has a manganese content of 74 to 82 per cent, no more than 1.25 per cent silicon, and no more than 7.5 per cent carbon).

Changeover—Pittsburgh Coke & Chemical will make ferromanganese and spiegeleisen in its "A" blast furnace (one of two stacks it has on Neville Island, Pittsburgh). To adapt this furnace for these products, the company spent $2.5 million, half of which was for a gas cleaning system to prevent air and stream pollution. In producing ferromanganese, a blast furnace turns out heavy, dense fumes. So, gas cleaning is a different and bigger problem than with a furnace making pig iron.

Pittsburgh Coke & Chemical's adapted furnace has a daily capacity of around 400 tons of ferromanganese, or more of spiegeleisen. The latter is a low-manganese alloy (16 to 28 per cent manganese).

Flexible—A furnace adapted for production of ferromanganese or spiegel can still make pig iron.

In making ferromanganese, high-grade manganese ore is charged into the blast furnace. Two-thirds of the world's supply of manganese ore is in Russia and other Iron Curtain countries. Pittsburgh Coke & Chemical gets its manganese ore from Africa, Brazil, India, Cuba, Mexico, Indonesia, Chile, Angola, and the U. S.

Around 90 per cent of all manganese alloys is used in producing ordinary carbon steel, the rest in special alloys and stainless steel, the company says. Consumption of manganese alloys closely parallels steel production.

Looking Ahead—The sizable expansion in steel capacity led the company to believe that demand for ferromanganese will grow. Most of the nation's blast furnace ferromanganese has been made by four companies.

Pittsburgh Coke & Chemical cites its favorable location to consumers of ferromanganese: It can ship by water, rail and truck.

Sales Force—To sell its new product, the company formed a wholly owned subsidiary, Neville Ferro Alloy Co. James MacBeth is the subsidiary's vice president of sales and W. C. Hillman is sales manager.

At Pittsburgh Coke & Chemical, R. M. Marshall is chairman; Henry L. Hillman, president. Its products include coke, merchant pig iron, cement, and chemicals.

Pricing — The company will charge the standard market price for ferromanganese and spiegel.

If expansion of facilities to produce these two products should be deemed necessary, the company probably will look to its blast furnace at Struthers, Ohio (near Youngstown). This stack, now idle, could be readily converted to ferromanganese production.

Steel Mills Grow

One-third of 1957 expansion is in Mid-Atlantic area. Sparrows Point plant takes No. 1 spot

LARGEST gains in steelmaking capacity last year were made in the Mid-Atlantic (13.7 per cent) and Cleveland (13 per cent) districts. All other districts registered increases ranging from 2 to 9 per cent, with the exception of New England. It had a loss of 28.8 per cent.

Steelmaking capacity in the U. S. rose 7,283,420 tons last year to a record 140,742,570 tons, as reported

After cooling and hardening, ferromanganese is ripped out of the special gondola car in which it is cast at Pittsburgh Coke & Chemical Co.'s plant at Neville Island, Pittsburgh. Next step is the crusher which reduces the material to specified size

by the American Iron & Steel Institute (STEEL, Jan. 20, p. 37).

Almost one-third of the increase (2,403,100 tons) was added to the capacities of mills in the Mid-Atlantic district, now totaling 19,966,820 tons. The Sparrows Point, Md., plant of Bethlehem Steel Co. becomes the largest steel mill in the world with an annual capacity of 8,200,000 tons, a gain of 2 million tons over a year ago.

Runner-Up—The Cleveland district gained 935,000 tons. Jones & Laughlin Steel Corp. added 420,000 tons to annual capacity. Republic Steel Corp. added 400,000 tons, and National Tube Div., U. S. Steel Corp., made a slight expansion at its Lorain Works.

Both Chicago and Pittsburgh districts increased capacities over 700,000 tons, or about 3 per cent, and retained their positions as the first and second largest in the country. Their capacities as of Jan. 1, 1958, are placed at 27,081,700 and 24,488,030 tons, respectively.

Reasons for Drop—The drop of 219,200 tons in capacity of New England mills was due to the dismantling of three open hearths and reduction in the rated capacity of the two electric furnaces at Bridgeport, Conn. Carpenter Steel of New England took over the mill late last year from the bankrupt Northeastern Steel Corp.

Capacities in net tons of the ten largest steelmaking companies as of Jan. 1, 1958, with the gains last year noted in parentheses are: U. S. Steel Corp., 40,212,000 (630,000); Bethlehem Steel Corp., 23 million (2.5 million); Republic Steel Corp., 12,242,000 (1,195,000); Jones & Laughlin Steel Corp., 7.5 million (900,000); National Steel Corp., 6.8 million (600,000); Youngstown Sheet & Tube Co., 6.5 million (260,000); Armco Steel Corp., 6,344,000 (394,000); Inland Steel Co., 5.8 million (300,000); Colorado Fuel & Iron Corp., 2,836,500 (7000); and Wheeling Steel Corp., 2.4 million (200,000).

Semi-finished Steel . . .

Semifinished Prices, Page 127

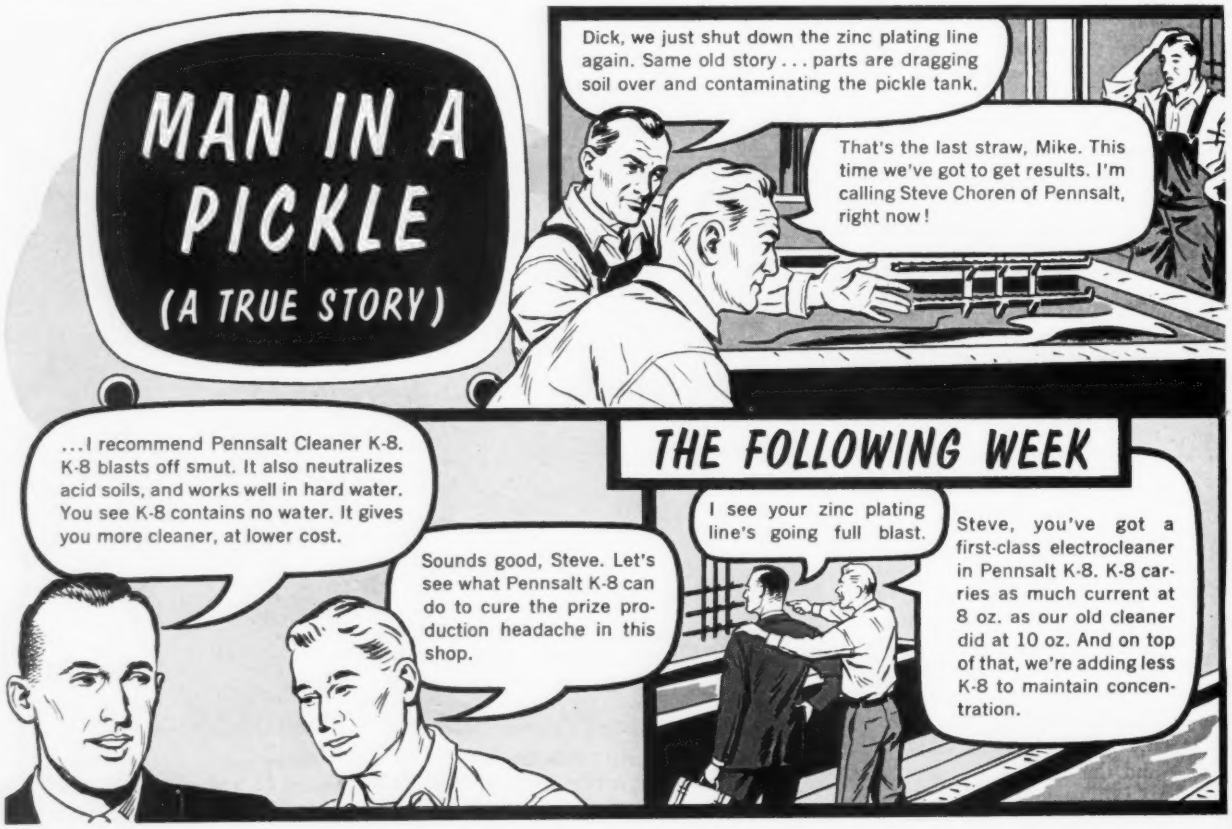
Steelmaking operations continue to slow down, the national ingot rate last week slipping another 1½ points to 54 per cent of current rated capacity (2,699,173 net tons weekly).

Last week, Jones & Laughlin Steel Corp. started halting operations at its Cleveland Works to complete a modernization and expansion program. The production shutdown will extend over the next four weeks, but it will be ten weeks before the plant is back to normal operations. The shutdown chiefly is to permit installation of a roughing mill.

Wheeling Steel Corp. is idling its South Works at Mingo Junction, Ohio, through February. This plant, with three blast furnaces, two bessemer converters and a blooming mill, will resume operations March 3. While the Mingo Junction facilities will be down, Wheeling is increasing open hearth steel production at its Steubenville, Ohio, Works by about 40 per cent.

A Wheeling spokesman says: "There are indications that the low point in operations (of Wheeling plants) will be reached in February. If present signs persist, the curve of production may get started upward again within a few weeks."

At San Francisco, although the current rate of steel mill operation


MAN IN A PICKLE
(A TRUE STORY)
Dick, we just shut down the zinc plating line again. Same old story . . . parts are dragging soil over and contaminating the pickle tank.
That's the last straw, Mike. This time we've got to get results. I'm calling Steve Choren of Pennsalt, right now!
. . . I recommend Pennsalt Cleaner K-8. K-8 blasts off smut. It also neutralizes acid soils, and works well in hard water. You see K-8 contains no water. It gives you more cleaner, at lower cost.
Sounds good, Steve. Let's see what Pennsalt K-8 can do to cure the prize production headache in this shop.
THE FOLLOWING WEEK
I see your zinc plating line's going full blast.
Steve, you've got a first-class electrocleaner in Pennsalt K-8. K-8 carries as much current at 8 oz. as our old cleaner did at 10 oz. And on top of that, we're adding less K-8 to maintain concentration.

doesn't reflect any improvement, mill spokesmen say there has been a slight pickup in orders the last couple of weeks.

The current dull period in steel demand is giving Bethlehem Pacific Coast Steel Corp. an opportunity to expedite construction of its new Seattle facilities underway for several months. The open hearth section was closed down Feb. 1. It is expected the electric furnaces will be placed in operation early in March. The 22-in. mill is idle as operations have been halted during construction of a new mill building.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 128 & 129

Inquiry for hot and cold rolled sheets is turning slightly upward. Shipments this month may show little change, but there are indications that March tonnage definitely will be heavier. Extent of the improvement will depend on automotive requirements. Ordering on appliance industry account presently is described as modest.

Prompt delivery still is being stressed in placing orders. This could indicate that inventories are low in many instances, and that consumers are buying for needs in sight. The decline in finished goods backlogs operates against heavy forward ordering of sheets.

March business will probably be the heaviest of any month in the first quarter. Automotive suppliers, though, are not getting larger releases for parts, and are holding off purchases. This might mean that next month's volume will not be much larger than February's.

One Pittsburgh producer last week was moderately confident of a March upturn. He said: "We expect to 'bottom out' this month and start to gain in sheet sales in March. We already have booked several March orders, but it is too early to tell the full extent of the March demand."

Galvanized sheet business isn't good, but some producers are doing better than they had expected. Ordering should pick up seasonally next month. Demand for high silicon sheets is holding up well, but low silicon sheets are moving sluggishly, reflecting, in part, the lag in small motor needs.

Steel Bars . . .

Bar Prices, Page 127

With spot buying gaining, and deliveries the governing factor in the placement of business in an increasing number of instances, indications are many steel bar consumers are getting to the bottom of their stockpiles.

Most buyers in the East are asking for deliveries within two weeks or less, and, by shopping around, they can usually obtain tonnage in that range, at least in the hot rolled and cold drawn grades. In some cases, shipments can be had in less than a week.

Over-all, demand continues sluggish, and is just about in line with producers' expectations, no sharp improvement being imminent in any of the large areas of consumption, such as automobiles.

Volume has slowed to a trickle in New England in the carbon and alloy grades, February demand proving slower than that in January, and March bookings showing little promise of substantial improvement. Better than 80 per cent of requirements in the district are for bars

. . . so I figured maybe you could help us, Steve. The cleaners we've been using just aren't getting the heavy oil and carbon smut off these parts. Got any suggestions?
Looks like your job calls for a real heavy duty electro-cleaner, Dick, one that delivers top performance even when your tanks are heavily contaminated with soil. That's why . . .
Yes, I talked to the boys as I came through the shop. Sounds to me as though K-8 surpassed even my expectations.
Ours too, Steve. K-8 is doing a whale of a job. I can honestly say that we wouldn't change materials now even if we were offered another cleaner at lower cost.

Makes good sense to improve metalworking with chemical know-how . . gained from wide experience in the field. Call in your Pennsalt salesman. He can help you to "A BETTER START FOR YOUR FINISH"

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2 in. and under. Many grades in that size range can be shipped from stock.

Although defense contracts are low, some slight pickup in inquiry is reported. In the East, 4500 tons of shell stock are pending placement by the Frankford, Pa., Arsenal.

Most cold-drawn bar mills in the Pittsburgh area are operating one shift daily, four days a week. Producers have built up stocks of standard sizes and are in position to give prompt shipments, but, while sales gains are indicated for March, February volume is expected to trail January's.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 127

Seasonal improvement in demand for concrete reinforcing steel bars is developing in the East, largely for bridges and schools. Requirements for highway mesh are expected to join the trend by March.

Although mill prices to fabricators are firm, competition among distributors is easing reinforcing bar prices at that market level. Contractors' estimates for bars in place are holding. In the East, for bridges, 10 cents a lb, delivered site, prevails, with 3 cents for placing. At this estimate, a substantial margin is possible for contractors, probably the highest in the chain of distribution.

Estimates are being taken on 2000 tons of bars for a 21-story office building and attached garage at Cleveland.

Wire . . .

Wire Prices, Pages 129 & 130

Demand for merchant wire products for March-April shipment has improved slightly, but competition from foreign tonnage, notably nails, is a retarding factor in sales. This is particularly noticeable in areas that can be served from coastal ports.

Spring and heading wire bookings for February are light in the East. The mills lack backlogs on industrial carbon grades.

Most buying is for prompt shipment, in many cases well ahead of normal leadtime. Orders are frequently placed on the basis of best delivery service.

Demand from the automotive industry continues slack with valve spring wire making the best showing. Demand for tempered stock for springs is better than that for other items.

Tubular Goods . . .

Tubular Goods Prices, Page 131

Inventory liquidation by oil country tubular goods users should be completed by the end of March, says one of the major Pittsburgh producers. Stock trimming is expected to continue through the remainder of the first quarter. Though sales currently are slow, an increasing number of inquiries for April delivery tonnage is reported.

Pipemakers are building up distributors' stock, and are pressing the market for all the small orders that can be developed.

Demand for pressure tubing is fairly strong. Requirements of a number of large boiler manufacturers are being placed. In contrast, mechanical tubing is moving slowly. Purchasing by the warehouses is well below last year's level.

Seasonal requirements of municipalities for cast iron pipe are stimulating the market in the Pacific Northwest. District sales agencies anticipate an active quarter.

Stainless Steel . . .

Stainless Steel Prices, Page 131

Production of stainless and heat-resisting steel ingots (all types) in 1957 declined to 1,000,357 net tons from 1,210,569 the year preceding, reports the American Iron & Steel Institute. Output also was under that in 1955 (1,191,177 tons), but topped that in 1954 (824,117 tons).

Fourth quarter, 1957, production was 206,624 tons, compared with 221,260 the preceding quarter, and 360,823 tons in the corresponding quarter of 1956.

These data are based on reports from 22 producing companies representing 97.1 per cent of total output in 1956.

Warehouse . . .

Warehouse Prices, Page 132

Lag in warehouse steel sales continued through January and carried over into this month. Consensus among distributors is that business will be slow in February, due to a combination of fewer working days, fewer orders, and less tonnage per order.

The belief is equally widespread that a pickup in business will develop in March, traditionally one of the better months of the year. Warehouse stocks are complete and adequate to meet all probable requirements. At the same time, consumers' inventories generally are low in sheets, bars, and tubing, but they can obtain fast delivery when material is needed.

The short term outlook is less favorable in plates. Reductions in construction activity and easing of plate supplies at mills have resulted in many users holding excessive stocks of that product. Their purchases from warehouses have declined rapidly.

Iron Ore Statistics—Fourth Quarter, 1957

QUARTERLY RECEIPTS OF IRON ORE & ORE AGGLOMERATES

(Gross tons; original sources)

Receipts:	U.S. Ores L. Superior	U.S. Ores Other	Canadian Ores L. Superior	Canadian Ores Other	Other Foreign Ores	Total Tonnage
United States	16,024,158	4,662,088	630,643	2,234,261	5,928,404	29,479,554
Canada	410,981	.....	177,806	346,573	87,955	1,023,315
Totals	16,435,139	4,662,088	808,449	2,580,834	6,016,359	30,502,869
Year:						
United States	79,032,199	20,193,577	2,890,182	8,766,529	22,255,211	133,137,698
Canada	3,731,315	.....	727,301	1,350,887	286,229	6,095,732
Totals	82,763,514	20,193,577	3,617,483	10,117,416	22,541,440	139,233,430

STOCKS OF IRON ORE ON HAND AT END OF FOURTH QUARTER

(Gross tons; original sources)

STOCKS:	U.S. Ores L. Superior	U.S. Ores Other	Canadian Ores L. Superior	Canadian Ores Other	Other Foreign Ores	Total Tonnage
In U. S.	45,645,236	3,404,387	1,684,842	5,824,458	7,477,481	64,036,404
In Canada	2,291,291	.....	46,704	586,467	158,184	3,082,646
Totals	47,936,527	3,404,387	1,731,546	6,410,925	7,635,665	67,119,050

QUARTERLY CONSUMPTION OF IRON ORE AND ORE AGGLOMERATES

(Gross tons; original sources)

CONSUMPTION:	U.S. Ores L. Superior	U.S. Ores Other	Canadian Ores L. Superior	Canadian Ores Other	Other Foreign Ores	Total Tonnage
In U. S.	15,668,026	4,560,851	625,905	1,754,780	4,951,824	27,561,386
In Canada	786,453	.....	187,871	252,085	43,161	1,269,570
Totals	16,454,479	4,560,851	813,776	2,006,865	4,994,985	28,830,956
Year:						
In U. S.	74,684,760	19,835,777	3,078,608	7,997,280	19,345,338	124,941,763
In Canada	3,785,438	.....	763,462	1,240,349	170,634	5,959,883
Totals	78,470,198	19,835,777	3,842,070	9,237,629	19,515,972	130,901,646

Alloy Steel Shipments

(Net tons)

Products	Net Shipments November	Net Shipments 11 Months, 1957
Full Alloy:		
Ingots, etc.	13,351	174,245
Blooms, etc.	33,713	401,166
Tube rounds	413	3,695
Wire rods	1,809	17,079
Structurals (heavy)	1,406	13,925
Plates	20,750	225,393
Wheels	117	730
Axles	31	200
Bars (hot rolled)	111,293	1,353,765
Bars (cold finished)	15,194	200,796
Tool steel	6,216	80,377
Oil country goods	27,994	382,145
Mechanical tubing	17,858	208,787
Pressure tubing	3,043	68,351
Wire (drawn)	3,176	38,517
Sheets (hot rolled)	591	9,743
Sheets (cold rolled)	443	4,418
Elec. sheets & strip	36,631	501,419
Strip (hot rolled)	1,392	15,329
Strip (cold rolled)	1,746	18,460
All other	12	539
Subtotal	297,179	3,719,079
HIGH STRENGTH, LOW ALLOY:		
Ingots, etc.	.....	90
Blooms, etc.	67	181
Tube rounds	.....	.....
Structurals (heavy)	3,448	46,998
Plates	19,023	304,229
Bars (hot rolled)	1,278	20,056
Sheets (hot rolled)	26,429	276,789
Sheets (cold rolled)	2,758	35,430
Strip (hot rolled)	921	13,220
Strip (cold rolled)	175	1,045
All other	7	865
Subtotal	54,106	698,903
Total Alloy Steel	351,285	4,417,982

Data from American Iron & Steel Institute.

SHIPMENTS OF STAINLESS & HEAT RESISTING STEELS

(Net tons)

Products	Net Shipments November, 1957	Net Shipments 11 Months, 1957
STAINLESS:		
Blooms, slabs, etc.	691	23,374
Tube rounds	1,122	18,756
Wire rods	374	4,722
Structurals (heavy)	2	88
Plates	1,995	35,214
Bars (hot rolled)	3,014	46,485
Bars (cold finished)	3,214	52,413
Mechanical tubing	294	4,067
Pressure tubing	724	13,254
Wire (drawn)	1,857	25,604
Sheets (hot rolled)	2,537	23,967
Sheets (cold rolled)	7,997	129,327
Strip (hot rolled)	1,107	8,157
Strip (cold rolled)	17,933	182,071
All other	8	48
Subtotal	42,869	567,547
HEAT RESISTING:		
Blooms, slabs, etc.	52	671
Tube rounds	.....	.....
Plates	30	1,849
Bars (hot rolled)	193	4,524
Bars (cold finished)	26	376
Pressure tubing	511	9,117
All other	6	255
Subtotal	818	16,792
Total Stainless & Heat Resisting Steel	43,687	584,339

Data from the American Iron & Steel Institute.

Structural Shapes . . .

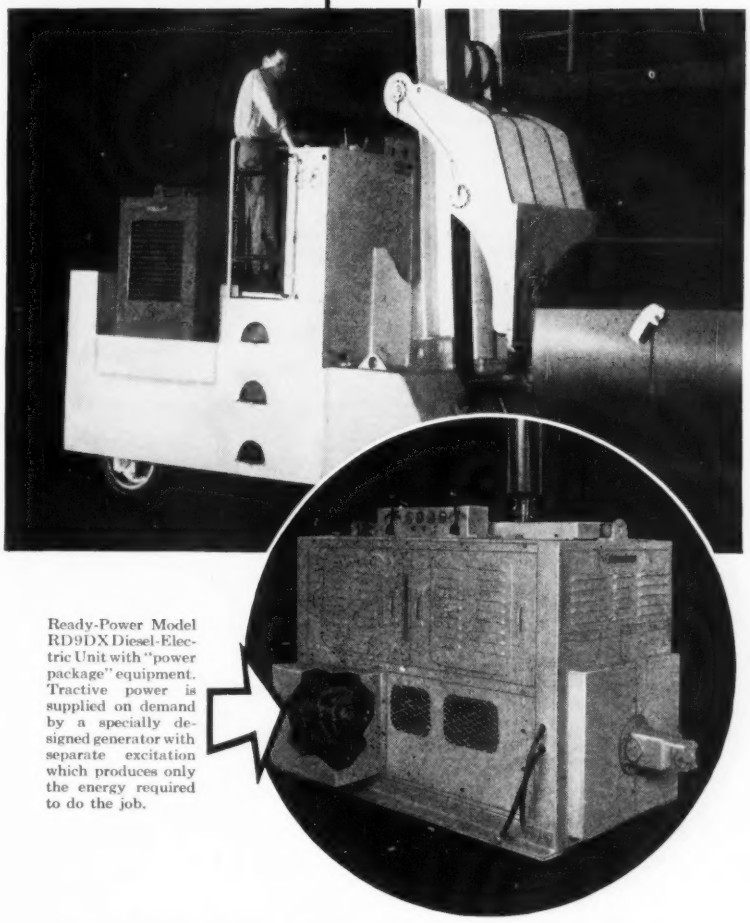
Structural Shape Prices, Page 127

Structural steel should be among the first products to be stimulated by a seasonal surge in demand. In some areas, inquiry already is improving, though the volume of orders shows no important change. Fabricators' backlogs in the Pacific

New Diesel-Electric "Power-Package" Does Both Jobs Economically

1 GENERATES TRUCK MOTIVE POWER

2 DIRECT-DRIVES HYDRAULIC PUMP



Ready-Power Model RD9DX Diesel-Electric Unit with "power package" equipment. Tractive power is supplied on demand by a specially designed generator with separate excitation which produces only the energy required to do the job.

Ready-Power makes diesel-electric power doubly effective with a newly developed "power package" designed specifically for use with its "RD" Series Power Units. This remarkable new concept allows the unit to operate at *constant speed*, no load to full load, yet supplies full range of tractive power on demand and produces continuous hydraulic power without need for intermediate electric motors. The last word in simplicity, this new "power package" eliminates contactor failure, minimizes maintenance, assures maximum operating economy for electric trucks up to 200,000 lb. capacities. Write for complete information.

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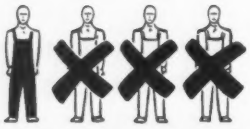
Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electic Power Units for Industrial Trucks

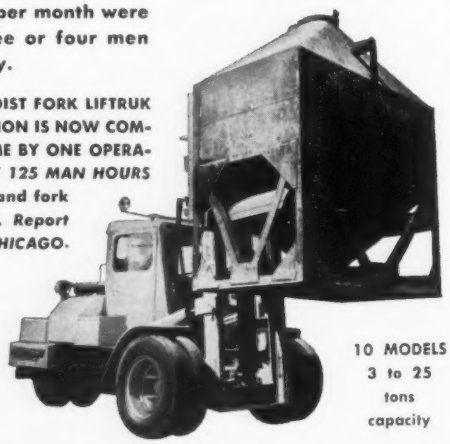
SILENT HOIST LIFTRUK



INLAND STEEL IS SAVING approx. 125 MAN HOURS EACH MONTH on JUST ONE SPECIFIC REQUIREMENT

"Four to six cars of carbide per month were formerly unloaded by three or four men working eight hours per day.

"THROUGH THE USE OF SILENT HOIST FORK LIFTRUK Model FK 7½, THIS SAME OPERATION IS NOW COMPLETED IN A PORTION OF THE TIME BY ONE OPERATOR . . . *SAVING APPROXIMATELY 125 MAN HOURS PER MONTH*" . . . releasing men and fork truck for other useful purposes. *Report from INLAND STEEL CO. EAST CHICAGO.*



SILENT HOIST LIFTRUK is a real work horse — operates long periods without maintenance — on muddy or irregular terrain. STANDARD EQUIPMENT includes Fluid Drive, Power Steering, High Undercarriage, extra large torque multiplier for traction.

10 MODELS 3 to 25 tons capacity

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Northwest, though, improved noticeably during January.

The New York market is featured by 20,000 tons of approach work for the Throggs Neck Bridge, bids being taken by the Triborough Bridge & Tunnel Authority Feb. 25.

Bids are in on a 5000-ton railroad bridge at Philadelphia, but state bridge work in Pennsylvania is disappointing. Also, industrial and commercial projects of importance are lacking.

Bridge estimating is slightly heavier in New England, 7500 tons being presently before the market there. School building jobs are holding up, but other types of construction are slower.

Inquiries are bringing out more estimates on the separate jobs, reflecting growing competition as fabricators' backlogs shrink. This is also resulting in an easing of prices on steel in place.

More than 3000 tons of structurals were booked by Isaacson Iron Works, Seattle, for the 17-story Norton Bldg. and garage at Seattle. Contracts pending in that district include 1200 tons for the Priest Rapids power project, 500 tons for the Benson Hotel, Portland, Oreg., and 500 tons for the National Bank of Commerce addition, Seattle. The Hawthorne Bridge approach job at Portland, which originally called for 430 tons of shapes, was awarded prestressed concrete, reducing the shape tonnage to 85.

Nashville Bridge Co. plans a $500,000 plant expansion at its Bessemer, Ala., plant, including larger girder and galvanizing facilities.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4120 tons, state highway bridges, Hamilton County, Ohio, 1500 tons to International Steel Co., Evansville, Ind., and 2620 tons to American Bridge Div., U. S. Steel Corp., Pittsburgh; Fenker Construction Co., Cincinnati, general contractor.

3000 tons, 17-story Norton Bldg., Seattle, to Isaacson Iron Works, Seattle; Howard S. Wright & Co. Inc., Seattle, general contractor.

780 tons, state highway structure (Shinnecock Canal Bridge) Sunrise Highway, Suffolk County, New York, to Harris Structural Steel Co., New York; Halloran Construction Co., Providence, R. I., general contractor.

100 tons or more, hangar doors and facilities, Salmon and Galena airports, Alaska, to Premier Gear & Machinery Works, Portland, Oreg., at $249,500 by the U. S. Engineer, Anchorage, Alaska.

275 tons, structurals and bars, high school, Pennsauken, N. J., to Camden Iron Works, Camden, N. J. (structurals); Concrete Steel Co., Philadelphia (reinforcing bars); Costanza Contracting Co., Pennsauken, general contractor.

300 tons, structurals and bars, laboratory and office building, American Cyanamid Co.,

Wallingford, Conn., to Irvington Iron & Steel Co., New Brunswick, N. J. (structurals); Fireproof Products Inc., New York (reinforcing bars); W. J. Megin Co., Naugatuck, Conn., general contractor.

170 tons, District of Columbia, Park Road Bridge, Washington, through Ole Hansen & Sons Inc., Pleasantville, N. J., general contractor, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

STRUCTURAL STEEL PENDING

20,000 tons, approach work, Throggs Neck Bridge, Triborough Bridge & Tunnel Authority, Randalls Island, Manhattan, New York; bids Feb. 25.

5000 tons, Delair vertical lift span, Pennsylvania Railroad, Philadelphia, bids to be closed Feb. 5.

6000 tons, elevated structures, J. F. Fitzgerald Expressway, Union Park Street to Massachusetts Avenue, with interchanges, Section P, Boston; M. De Matteo Construction Co., Quincy, Mass., low on general contract.

315 tons, extension, state highway viaduct, Seattle; bids to Olympia, Wash., Feb. 18.

220 tons, also 75 tons of reinforcing, Washington State, King County flat slab bridge; bids to Olympia, Wash., Feb. 18.

150 tons, junior college buildings, Clear Lake, Wash.; Newland Construction Co., Everett, Wash., low at $934,617.

100 tons, state highway bridge, Falmouth, Maine; bids Feb. 12, Augusta, Maine.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2705 tons, state highway bridges, Hamilton County, Ohio, to Pollak Steel Co., Cincinnati; Penker Construction Co., Cincinnati, general contractor.

225 tons, two Washington State bridges, Thurston County, to Northwest Steel Rolling Mills Inc., Seattle.

220 tons, reinforcing and structurals, junior high school, Windsor, Conn., to Scherer Steel Co., East Hartford, Conn. (reinforcing bars); Kilpatrick Structural Steel Co., Manchester, Conn. (structurals); Fairoaks Construction Co., Hartford, Conn., general contractor.

200 tons, Washington State, Mud Bay highway project, Thurston County, to Northwest Steel Rolling Mills Inc., Seattle; Fiorito Bros., Seattle, general contractor.

135 tons, Shinnecock Canal Bridge, Sunrise Highway, Suffolk County, New York, to Igoe Bros., Newark, N. J.; Halloran Construction Co., Providence, R. I., general contractor.

150 tons, alkali treatment plant, Seattle, to Soule Steel Co., Seattle.

90 tons, junior high school, Everett, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

3040 tons, addition to state highway viaduct, Seattle; bids to Olympia, Wash., Feb. 18.

2000 tons, 21-story office building and attached eight-story garage, Tishman Realty & Construction Co. Inc., Superior Avenue, Ninth and Walnut streets, Cleveland; taking estimates.

335 tons, Washington State, two girder bridges, Chelan County; bids to Olympia, Wash., Feb. 18.

235 tons, also steel piling, Washington State girder bridge, Clark County; bids to Olympia, Wash., Feb. 18.

PIPE . . .

CAST IRON PIPE PLACED

900 tons, 16 to 4 in., two Seattle improvement districts; to U. S. Pipe & Foundry Co., Seattle; general contract to Superior Construction Co., Seattle, at $366,356.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian National, 151 diesel units, fifty-five 1200-hp and twenty-six 1750-hp road switching units going to the General Motors Diesel Ltd., London, Ont., and forty-five 1800-hp and fourteen 1800-hp passenger units, and eleven 1000-hp road switchers to Montreal Locomotive Works, Montreal, Que.

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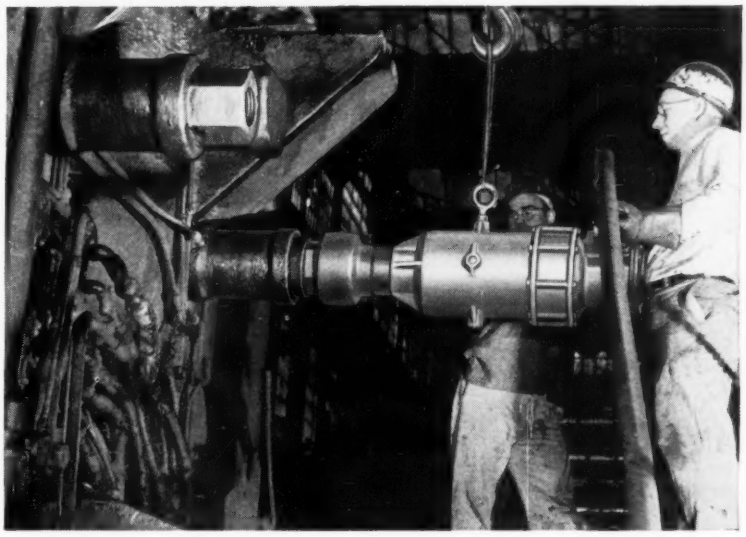
added to Ingersoll-Rand

Impactool family . . .

new size 599 SUPER SLUGGER



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Like all the other 21 sizes of Impactools bearing the I-R trademark, this tool uses the time-proven ball and cam impact mechanism.

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Aluminum Division,
Olin Mathieson Chemical Corporation,
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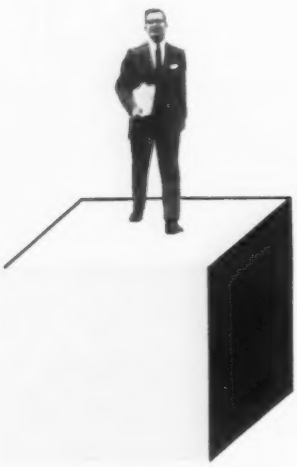

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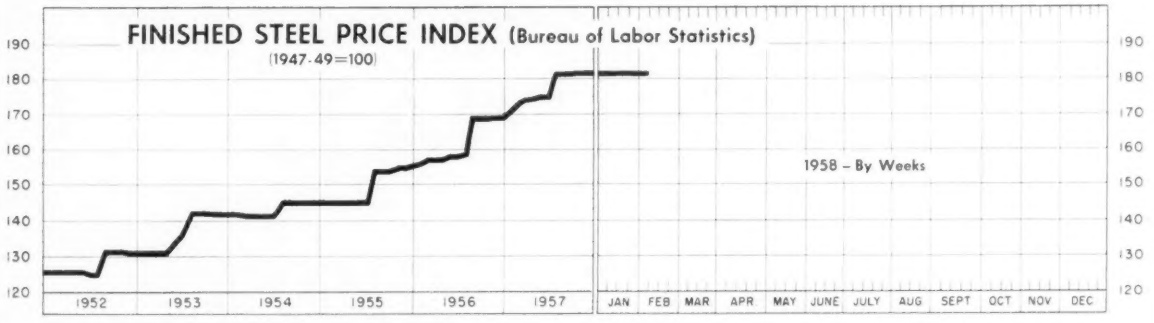
Price Indexes and Composites



Feb. 4, 1958	Week Ago	Month Ago	Jan. Avg.	Year Ago
181.7	181.7	181.7	181.7	171.9

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Feb. 4

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600
Rails, Light, 40 lb	7.067
Tie Plates	6.600
Axles, Railway	9.825
Wheels, Freight Car, 33 in. (per wheel)	60.000
Plates, Carbon	6.150
Structural Shapes	5.942
Bars, Tool Steel, Carbon (lb)	0.535
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850
Bars, H.R., Alloy	10.525
Bars, H.R., Stainless, 303 (lb)	0.525
Bars, H.R., Carbon	6.425
Bars, Reinforcing	6.210
Bars, C.F., Carbon	10.360
Bars, C.F., Alloy	13.875
Bars, C.F., Stainless, 302 (lb)	0.553
Sheets, H.R., Carbon	6.192
Sheets, C.R., Carbon	7.089
Sheets, Galvanized	8.230
Sheets, C.R., Stainless, 302 (lb)	0.688
Sheets, Electrical	12.025
Strip, C.R., Carbon	9.243
Strip, C.R., Stainless, 430 (lb)	0.493
Strip, H.R., Carbon	6.245
Pipe, Black, Buttweld (100 ft)	19.814
Pipe, Galv., Buttweld (100 ft)	23.264
Pipe, Line (100 ft)	199.023
Casing, Oil Well, Carbon (100 ft)	194.499
Casing, Oil Well, Alloy (100 ft)	304.610
Tubes, Boiler (100 ft)	49.130
Tubing, Mechanical, Carbon (100 ft)	24.953
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
Black Plate, Canmaking Quality (95 lb base box)	7.583
Wire, Drawn, Carbon	10.225
Wire, Drawn, Stainless, 430 (lb)	0.653
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.828
Wire, Barbed (80-rod spool)	8.719
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Feb. 5 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.92	181.31
Index in cents per lb	6.479	6.479	6.479	6.111	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$137.98	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	62.63	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	55.77
Steelmaking Scrap, GT	37.33	35.50	33.30	55.17	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 5 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.725	5.365	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.31	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.975-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.475-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.20	6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.15	6.15	6.15	5.80	4.425

PIG IRON, Gross Ton	Feb. 5 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$55.50
Basic, Valley	66.00	66.00	66.00	62.50	54.50
Basic, deld., Phila.	70.01	70.01	70.01	66.26	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, deld., Phila.	70.51	70.51	70.51	66.76	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	63.00	55.00
Malleable, Chicago	66.50	66.50	66.50	63.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	255.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$34.50	$33.50	$32.50	$54.50	$44.00
No. 1 Heavy Melt, E. Pa.	38.50	38.50	37.00	59.00	41.50
No. 1 Heavy Melt, Chicago	39.00	34.50	30.50	52.00	42.50
No. 1 Heavy Melt, Valley	35.50	30.50	29.50	53.50	44.00
No. 1 Heavy Melt, Cleve.	31.50	29.50	26.50	51.50	43.00
No. 1 Heavy Melt, Buffalo	28.50	28.50	29.50	53.50	43.00
Rails, Rerolling, Chicago	54.50	53.50	49.50	71.00	52.50
No. 1 Cast, Chicago	42.50	42.50	39.50	46.50	43.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.00	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.00	17.00

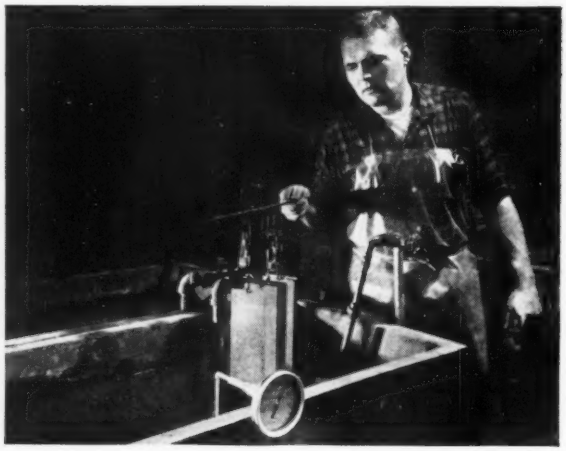
ANNOUNCING SERSEAL*

(trademark)

a new chemical blanket for hot phosphating baths

REDUCES FIXED OPERATING COSTS

BEFORE SERSEAL, steam, vapors and fumes escape from the bath, make working conditions unpleasant, lowering morale.



SERSEAL HAS BLANKETED THE BATH in just 10 seconds. All steam, corrosive fumes and vapors are contained within bath.

8 REASONS WHY

1. Reduces the cost and time required for maintenance of heating elements.
2. Improves working conditions both from a comfort and health standpoint. Steam, heat, fumes and vapors are contained within the bath.
3. Saves up to 70% in heating costs.
4. Cuts warmup time. The blanket prevents heat loss.
5. Less corrosion of surrounding equipment. Corrosive elements are retained in the bath.
6. Less equipment downtime. Baths require less replenishing. Equipment requires less maintenance.
7. Less exhaust equipment required. Since the bath is sealed, there is little escape of fumes and vapors. And in many cases, ventilating systems can be safely eliminated.
8. Lower chemical cost and also less critical control necessary on some processes.

*Patent applied for

Write us today for complete information about this new cost-reducing chemical blanket for hot phosphating baths

AMERICAN CHEMICAL PAINT COMPANY

Ambler 19, Pa.

CHEMICALS ACP PROCESSES

Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont.

New Chemical Horizons for Industry and Agriculture

Steel Prices

Mill prices as reported to STEEL, Feb. 5, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 128; to footnotes, page 130.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B3 .....77.50
Lackawanna,N.Y. B2..77.50
Munhall,Pa. U5 .....77.50
Owensboro,Ky. G8 .....77.50
S.Chicago,Ill. R2, U5..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3 .101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Owensboro,Ky. G8 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2, U5, W14..96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ....105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$114.00
Bridgeport,Conn. C32..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 .121.00
Detroit S41 .....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ..135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 ...114.00
Lackawanna,N.Y. B2 .114.00
Los Angeles B3 ....134.00
Lowellville,O. S3 .....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Owensboro,Ky. G8 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14..114.00
S.Duquesne,Pa. U5 ...114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$117.50
Canton,O. R2 .....120.00
Cleveland R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ..117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 .....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 .....6.15
N.Tonawanda,N.Y. B11 6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 ....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ...5.275
Johnstown,Pa. B2 .....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ...5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ...5.325
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ...5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4....5.325
S.Chicago,Ill. U5 ....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 ....6.225
Weirton,W.Va. W6 ....6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10..5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 ....5.10
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.10
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.10
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.20
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown U5, Y1 ....5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....6.75
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Johnstown,Pa. B2 .....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 .....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 .....7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1 .8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 .7.625
SparrowsPoint,Md. B2..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Economy,Pa. B14 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2..7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ...6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10...5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ...5.425
Aliquippa,Pa.(9) J5 ....5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ...5.425
Birmingham(9) C15 ...5.425
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ...5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1..5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 ....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(23)B11 5.775
Owensboro,Ky.(9) G8 ..5.425
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 .....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ....5.425
Torrance,Calif.(9) C11..6.125
Youngstown(9) R2, U5..5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 .....6.475
Bridgeport,Conn. C32 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 .....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Economy,Pa. B14 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 .....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 .....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Owensboro,Ky. G8 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 .....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14..7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ...5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 .....10.10
Chicago W18 .....9.25
Cleveland C20 .....9.925
Elyria,O. W8 .....9.925
LosAngeles S30
(Grade A) 11.30
(Grade B) 11.80
LosAngeles P2
(Grade A) 11.40
(Grade B) 11.90
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 .....10.10
SpringCity,Pa. K3 .....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....7.30
BeaverFalls,Pa. M12,R2.7.30
Birmingham C15 .....7.90
Bridgeport,Conn. C32 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 .....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ...7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles(49) S30 ....8.75
LosAngeles P2, R2 ....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 .6.55

BARS, Cold Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30....10.75
Mansfield,Mass. B5 ...9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ...9.075
Youngtown F3, Y1 ....8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15 .....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 .....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ...5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 .5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
AllenportPa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill. (8)G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 .4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 .4.925
Steubenville,O. W10 ..4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.(19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 .7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	6.95	7.20
Canton,O. R2	6.95	7.45
Fairfield T2	6.95	7.20
Gary,Ind. U5	6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	6.95	7.20
Irvin,Pa. U5	6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	6.95	7.20
Pitts.,Calif. C11	7.70	...
Pittsburgh J5	6.95	...
SparrowsPt. B2	6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 ....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ....7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ..6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.425
Niles,O. (28) R2 ....7.425
Youngstown Y1 .....7.275
Weirton,W.Va. W6 ..7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).9.25
Butler,Pa. A10 (type 2).9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 ....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 ....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman & Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	5.125
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo (27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa. (25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Pittsburg,Calif. C11	5.675
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	6.35
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill. (1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25)B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor, Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia(45) P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y. (32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J. (31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.55
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45
Weirton,W.Va. W6	10.50
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanamized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	..	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
New York W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP Coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brakenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10(FP Coils)	....	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	....	....	....	....	Stator 7.85

	Transformer Grades			
H.R. SHEETS (22Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brakenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	....	19.20	19.70	20.20
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2,Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.85
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester A7, J4, T6	9.60

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7, P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	....16.55
Monessen,Pa. P16	....16.55
Roebling,N.J. R5	....17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	....11.65
Baltimore T6	.....11.95
Boston T6	.....11.95
Buffalo W12	.....11.65
Chicago W13	.....11.75
Cleveland A7	.....11.65
Crawfordsville,Ind. M8	.11.65
Dover,O. G6	.....11.65
Fostoria,O. S1	.....11.65
FranklinPark,Ill. T6	.11.75
Kokomo,Ind. C16	....11.65
Massillon,O. R8	.....11.65
Milwaukee C23	.....11.85
Monessen,Pa. P7, P16	..11.65
Palmer,Mass. W12	...11.95
Pawtucket,R.I. N8	....11.95
Philadelphia P24	.....11.95
Riverdale,Ill. A1	.....11.75
Rome,N.Y. R6	.....11.65
Sharon,Pa. S3	.....11.65
Trenton,N.J. R5	.....11.95
Warren,O. B9	.....11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock — **Col.**

AlabamaCity,Ala. R2	..173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville, Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	..175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla.(20) M8	184
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$9.10

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	..$9.80
Wheeling,W.Va. W10	...9.80

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	...175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind M8	..177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	186
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
Kokomo,Ind. C6	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	.$10.26
Atlanta A11	.....10.36
Bartonville,Ill. K4	....10.36
Buffalo W12	.....10.26
Chicago W13	.....10.26
Crawfordsville,Ind. M8	.10.36
Donora,Pa. A7	.....10.26
Duluth A7	.....10.26
Fairfield,Ala. T2	.....10.26
Houston S5	.....10.51
Jacksonville,Fla. M8	..10.82
Johnstown,Pa. B2	.....10.26
Joliet,Ill. A7	.....10.26
KansasCity,Mo. S5	....10.51
Kokomo,Ind. C16	....10.36
LosAngeles B3	.....11.05
Minnequa,Colo. C10	....10.51
Pittsburg,Calif. C11	....11.04
S.Chicago,Ill. R2	.....10.26
S.SanFrancisco C10	....11.04
SparrowsPt.,Md. B2	....10.36
Sterling,Ill.(37) N15	....10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	.$10.60
Atlanta A11	.....10.70
Bartonville,Ill. K4	....10.70
Buffalo W12	.....10.60
Chicago W13	.....10.60
Crawfordsville,Ind. M8	.10.70
Donora,Pa. A7	.....10.60
Duluth A7	.....10.60
Fairfield,Ala. T2	.....10.60
Houston S5	.....10.85
Jacksonville,Fla. M8	..11.16
Johnstown,Pa. B2	....10.60
Joliet,Ill. A7	.....10.60
KansasCity,Mo. S5	....10.85
Kokomo,Ind. C16	.....10.70
LosAngeles B3	.....11.40
Minnequa,Colo. C10	..10.85
Pittsburg,Calif. C11	..11.40
S.Chicago,Ill. R2	.....10.60
S. SanFrancisco C10	..11.40
SparrowsPt., Md. B2	..10.70
Sterling,Ill.(37) N15	..10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	..$10.65
Atlanta A11	.....10.75
Bartonville,Ill. K4	....10.75
Buffalo W12	.....10.65
Chicago W13	.....10.65
Crawfordsville,Ind. M8	.10.75
Donora,Pa. A7	.....10.65
Duluth A7	.....10.65
Fairfield,Ala. T2	.....10.65
Houston S5	.....10.90
Jacksonville,Fla. M8	..11.21
Johnstown,Pa. B2	....10.65
Joliet,Ill. A7	.....10.65
KansasCity,Mo. S5	....10.90
Kokomo,Ind. C16	.....10.75
LosAngeles B3	.....11.45
Minnequa,Colo. C10	..10.90
Pittsburg,Calif. C11	..11.45
S.Chicago,Ill. R2	.....10.65
S.SanFrancisco C10	..11.45
SparrowsPt.,Md. B2	..10.75
Sterling,Ill(37) N15	..10.75

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	..212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	..214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg, Calif. C11	236
S.SnFrancisco C10	236
SparrowsPt.,Md B2	214
Sterling,Ill.(7) N15	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	..172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	..171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	..174

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	..193**
Aliquippa,Pa. J5	.....190§
Atlanta A11	.....198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	..198
Donora,Pa. A7	.....193†
Duluth A7	.....193†
Fairfield,Ala. T2	.....193†
Houston S5	.....198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	....196§
Joliet,Ill. A7	.....193†
KansasCity,Mo. S5	...198**
Kokomo,Ind. C16	.....195†
Minnequa,Colo. C10	...198**
Monessen,Pa. P7	.....196*
Pittsburg,Calif. C11	....212†
Rankin,Pa. A7	.....193†
S.Chicago,Ill. R2	.....193**
S.SanFrancisco C10	..213**
SparrowsPoint,Md. B2	..198§
Sterling,Ill.(7) N15	....198§

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	....187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	.....192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	..192
Donora,Pa. A7	.....187†
Duluth A7	.....187†
Fairfield,Ala. T2	.....187†
Houston S5	.....192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	..190§
Joliet,Ill. A7	.....187†
KansasCity,Mo. S5	...192**
Kokomo,Ind. C16	.....189†
Minnequa,Colo. C10	...192**
Pittsburg,Calif. C11	....210†
Rankin,Pa. A7	.....187†
S.Chicago,Ill. R2	....187**
Sterling,Ill.(7) N15	....192§

WIRE (16 gage)	An'ld Galv. Stone	An'ld Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	.17.15	18.95
Bartonville K4	..17.25	19.05
Cleveland A7	...17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	..17.65	19.20†
Houston S5	... 17.40	18.95**
Jacksonville M8	.17.50	19.30
Johnstown B2	..17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	..17.25	18.80†
Minnequa C10	..17.40	18.95**
P'lm'r,Mass. W12	17.45	19.00†
Pitts.,Calif. C11	.17.50	19.05†
SparrowsPt.	B2.17.25	19.05§
Sterling(37)	N15 .17.25	19.05§
Waukegan A7	..17.15	18.70†
Worcester A7	..17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	....8.65 9.325§
Atlanta(48) A11	..8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	....8.65 9.20†
Cleveland A7	....8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	..8.65 9.20†
Duluth A7	.....8.65 9.20†
Fairfield T2	.....8.65 9.20†
Houston(48) S5	.8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	....8.65 9.20†
Kans.City(48) S5	8.90 9.45**
Kokomo C16	.....8.75 9.30†
LosAngeles B3	..9.60 10.275§
Minnequa C10	..8.90 9.45**
Monessen P7(48)	..8.65 9.25*
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	..9.60 10.15†
Rankin,Pa. A7	..8.65 9.20†
S.Chicago R2	...8.65 9.20**
S.SanFran. C10	..9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	..8.90 9.575§
Sterling(1)(48)	..8.80 9.475§
Struthers,O.(48)Y1	8.65 9.30†
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: *13.50, †5c, $10c, ‡Less than 10c, ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter....	49.0
Longer than 6 in. ..	39.0
⅝ in. thru 1 in.:	
6 in. and shorter...	39.0
Longer than 6 in. ..	35.0
1⅛ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter..	49.0

Carriage, Machine, Lag Bolts
Hot Galvanized:

½ in. and smaller:	
6 in. and shorter..	29.0
Longer than 6 in. ..	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter..	49.0
Longer than 6 in. ..	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or Longer than 6 in. ..	39.0

Blank Bolts 39.0
Step, Elevator, Tire Bolts 49.0

Stove Bolts, Slotted:

⅛ to ¼ in. incl., 3 in. and shorter.	55.0
⅞ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:
All sizes 55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes 41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

⅜ in. and smaller..	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger..	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

⅜ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller..	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller..	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger..	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller..	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger..	53.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller..	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller..	8.0
¾, ⅞, and 1 in. diam.	+6.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller..	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller..	+13.0
¾, ⅞, and 1 in. diam.	+32.0

Flat Head Capscrews:

¾ in. and smaller..	+76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter..	Net
Longer than 6 in...	+23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25
7/8 in. under: List less 19%

BOILER TUBES

Net base c.l. prices dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	...(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C1'	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	.....6.60
Gary,Ind. U5	.....6.60
Ind.Harbor,Ind. I-2	....6.60
Lackawanna,N.Y. B2	..6.60
Minnequa,Colo. C10	....6.60
Seattle B3	.....6.75
Steelton,Pa. B2	.....6.60
Torrance,Calif. C11	....6.75

JOINT BARS

Bessemer,Pa. U5	.....6.975
Fairfield,Ala. T2	.....6.975
Ind.Harbor,Ind. I-2	...6.975
Joliet,Ill. U5	.....6.975
Lackawanna,N.Y. B2	..6.975
Minnequa,Colo. C10	....6.975
Steelton,Pa. B2	.....6.975

AXLES

Ind.Harbor,Ind. S13	...8.775
Johnstown,Pa. B2	....8.775

TRACK BOLTS, Untreated

Cleveland R2	.....14.75
KansasCity,Mo. S5	....14.75
Lebanon,Pa. B2	.....14.75
Minnequa,Colo. C10	...14.75
Pittsburgh P14	.....14.75
Seattle B3	.....15.25

SCREW SPIKES

Lebanon,Pa. B2 .....14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	.....9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	....9.75
Lebanon,Pa. B2	.....9.75
Minnequa,Colo. C10	....9.75
Pittsburgh J5	.....9.75
Seattle B3	.....10.25
S.Chicago,Ill. R2	.....9.75
Struthers,O. Y1	.....9.75
Youngstown R2	.....9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; and 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 5.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(48) 6-7Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	106.75	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	—Plates— Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....		4.285
18.25	4.25	1	4.75	....		2.500
18	4	2	9	....		2.870
18	4	2	....	....		1.960
18	4	1	....	....		1.795
9	3.5	..	....	....		1.395
13.5	4	3	....	....		2.060
13.75	3.75	2	5	....		2.440
6.4	4.5	1.9	....	5		1.300
6	4	3	....	6		1.545
1.5	4	1	....	8.5		1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	67.00
S.Chicago,Ill. W14	56.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld.	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah, C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio. I-3, J1	78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.27
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59‖	9.86‖	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.61	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.00	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	52.33	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	8.85	10.15	....	....	9.00	8.95	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.45	8.75	8.45	....	7.60	7.55	11.10	....	7.60	8.05	10.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	7.85	10.75	11.65	57.60	7.80	7.95	12.00	....	7.85	7.80	9.95
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96#	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	52.69	8.69	8.65	11.51#	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [8]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

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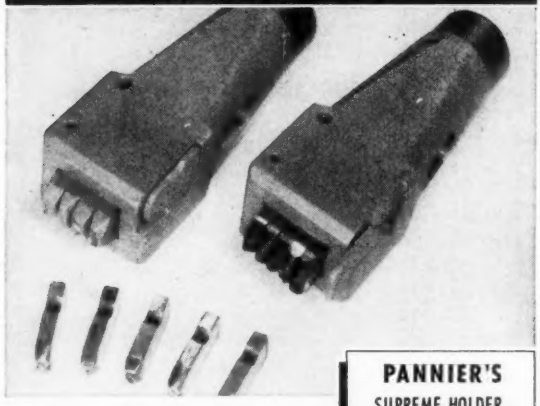

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Safe, fast type changing. Holder in variety of styles. Machined from High-Grade Bar Tool Steel. Hardened anvil maintains type alignment. Striking Head of Tool Steel . . . Replaceable to add long service life to Holder.

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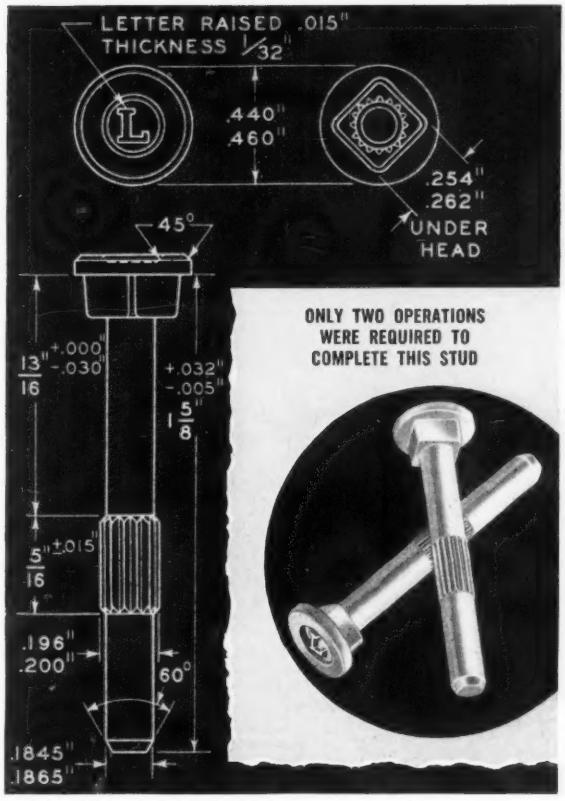

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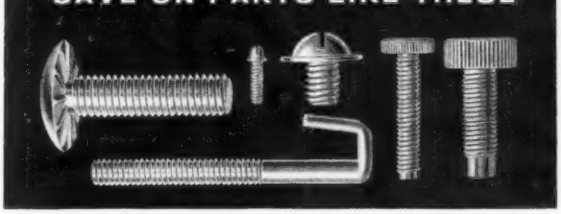

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Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa. $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500 lb drum, freight allowed Carlots	39.50
Ton lots	41.50
Antimony, 500 lb lots	42.00*
Brass, 5000-lb lots	*30.30-45.70†*
Bronze, 5000-lb lots	*45.70-49.80†*
Copper: Electrolytic	*14.75**
Reduced	*14.75**
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	*$1.15*
Nickel-Silver, 5000-lb lots	*47.80-52.60†*
Phosphor-Copper, 5000-lb lots	*57.80*
Copper (atomized) 5000-lb lots	*38.30-46.80‡*
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	*$1.07*
Stainless Steel, 316	*$1.26*
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99%	Dollars
60 to 200 mesh: 1000 lb and over..	3.15
Less than 1000 lb ..	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

——Inches—— Diam	Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305...	$5.68	$5.63	$5.68	$5.93
Bar Size Angles	5.98	5.93	5.98	6.23
Structural Angles	5.98	5.93	5.98	6.23
I-Beams	6.43	6.39	6.43	6.68
Channels	6.43	6.39	6.43	6.68
Plates (basic bessemer)	7.64	7.59	7.64	7.88
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.37	6.32	6.37	6.61
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.12	8.12	8.12	8.32

†Per 82 lb. net, reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	*25.00*
N. African hematite (spot)	nom.
Brazilian iron ore 68-69%	*27.00*

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	*$12.00-12.50**
Domestic, concentrates f.o.b. milling points	*20.00*

*Before duty.

Manganese Ore

Mn 46-48%. Indian (export tax included), $135 per long ton unit, c.i.f. U. S. ports. duty for buyer's account: other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	*$50.00*
48% 2.8:1	*48.00*
48% no ratio	*39.00*
South African Transvaal	
48% no ratio	*$37.00*
44% no ratio	*27.00*
Turkish	
48% 3:1	*$55.00*
Domestic	
Rail nearest seller	
18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens.	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	*33.29*
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.	

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You name the job or jobs to be done! We'll supply a crane or cranes that will do it. Standard Models in a wide range of styles, sizes and capacities will generally meet your requirements. If not, we'll engineer and build what you need. We've been doing it for more than 40 years.

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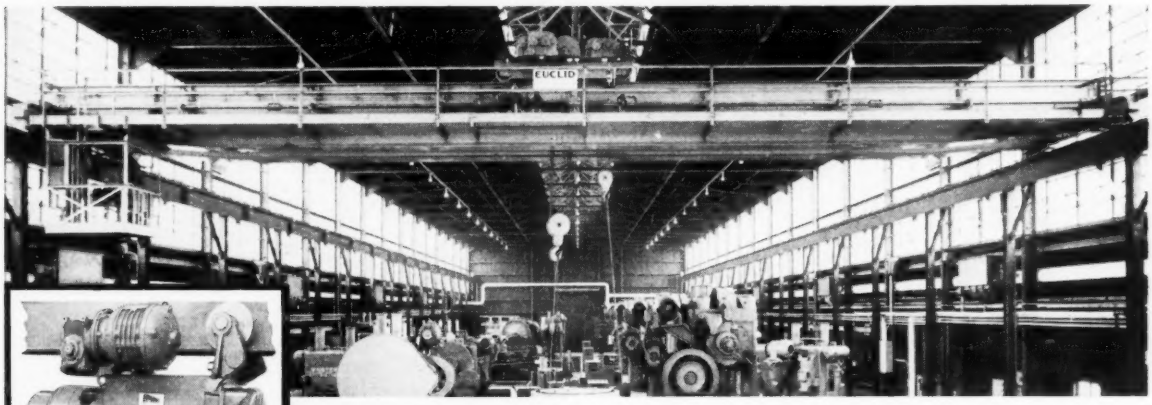

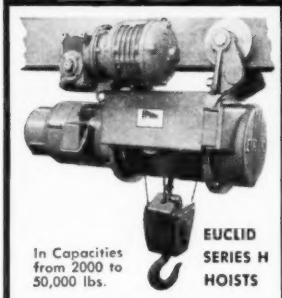

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The planetary gearing and mechanical load brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

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By Albert Portevin

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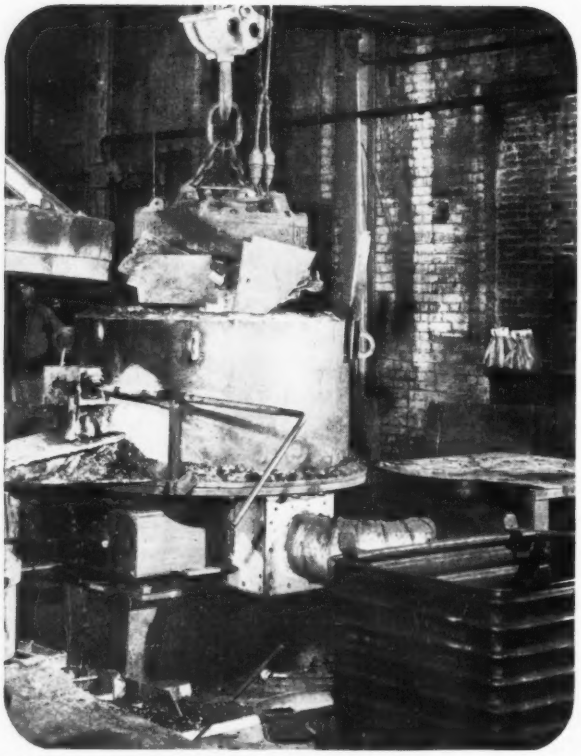

1 CHARGING FURNACE. One 36-inch Ohio Bolted Magnet charges six 375 KW furnaces giving 240 500-pound heats each 24 hours.

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3 SORTING. Castings are conveyed from Wheelabrator to hard-iron inspection. Ohio Magnet picks parts out of sorting bins.

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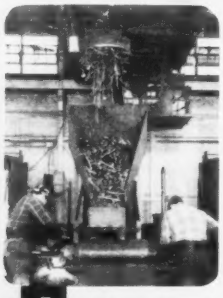

5 LOADING GRINDING HOPPER after conveying parts from inspection department. Same Ohio Magnet is used for operations shown in photos 3, 4 and 5.

Photos: Courtesy I-F Manufacturing Company, New Philadelphia, Ohio

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CHESTER BLAND
President

Small foundry or large, magnetic materials handling points the way to higher productivity, higher efficiency. And with Ohio Magnets on the job you get high availability, too. That's because Ohio Magnets are built with that extra margin of safety that means long, service-free life. Yes, *magnetic materials handling pays—especially with Ohio Magnets.*

THE OHIO ELECTRIC MFG. CO.
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Scrap Market Gathering Strength

Prices continue to advance despite absence of heavy mill buying. STEEL's composite on the prime grade advances another $1.83 a ton to $37.33

Scrap Prices, Page 138

Chicago—The local scrap market continues to build up strength pricewise despite notable absence of demand. The scattered purchases that are made, though, fit well into the higher-price pattern. Were this not the case, the bullishness in the market would appear ridiculous.

One large consumer has named $37 as its February buying price on No. 1 industrial heavy melting steel. The established price on that grade is several dollars higher, making it doubtful the mill can get material at its offering price.

Philadelphia — While domestic buying is light, the market undertone is fairly strong, due particularly to a brisk export demand, and to a lag in scrap collections. Domestic prices on the major open hearth grades are unchanged, but prices are higher on electric furnace bundles at $40, and low phos structurals and plate, quoted $41-$42, delivered. Malleable iron also is up $2 a ton to $58, delivered, and heavy turnings are nominally $3 a ton higher at $34.

New York — With scrap collections slow, and export buying strong, scrap brokers have advanced their buying prices on open hearth grades $1 a ton. They are offering $36-$37 on No. 1 heavy melting and No. 1 bundles, $32-$33 on No. 2 heavy melting, and $24-$25 on No. 2 bundles. Prices on all other grades are steady except 18-8 sheets, clips and solids which are easier at $140-$150.

Pittsburgh—Higher prices on industrial bundles and railroad scrap are giving the scrap market here a firmer tone. Demand continues sluggish for the leading steelmaking grades, but market observers say the mills would have to pay $35 a ton for No. 1 heavy melting, up $1 from last week's quoted price. Latest railroad lists show No. 1 heavy melting up $2. Other grades are unchanged.

Buffalo—With mill demand low, scrap prices are marking time here. Cast scrap is moving to foundries in fair volume, and this provides the only bright spot in the local market picture.

Cleveland—A definitely stronger tone has developed in the local scrap market though buying here is at a virtual standstill. Prices on the steelmaking grades are up $1 to $2 a ton on the strength of sales in the Valley of No. 1 heavy melting at $35, up $4 to $5 from previous sales.

Detroit—Scrap steel prices moved up here last week as auto lists closed at higher levels than had been anticipated. Most sales were to dealers and were not on the basis of mill orders. Tonnages were small. The industry feels the price increase is mainly in keeping with advances at other points.

Cincinnati—Prices on some grades of steelmaking scrap have moved upward another 50 cents to $1 a ton. No. 2 heavy melting is up 50 cents, based on buying by a local consumer.

St. Louis—The scrap market here is quiet but prices are firmer on demand from other districts.

Birmingham—Although prices on the cast iron grades are soft in the local market, they are firm in outside areas. A couple of railroad lists released last week brought $1 a ton more on some items.

Los Angeles—Scrap prices have slipped about $4 a ton on the average. No. 1 heavy melting is now quoted at $32, off $4; No. 2 heavy melting is $31, off $3; No. 1 bundles at $28 is down $4; No. 2 bundles are quoted down $3 to $21.

Plates . . .

Plate Prices, Page 127

Plate business is disappointing, the fall-off in demand being sharper than had been anticipated after supply-demand balance was attained in the fourth quarter last year.

Slower capital goods requirements are largely being reflected. Ship-

(*Please turn to Page* 143)

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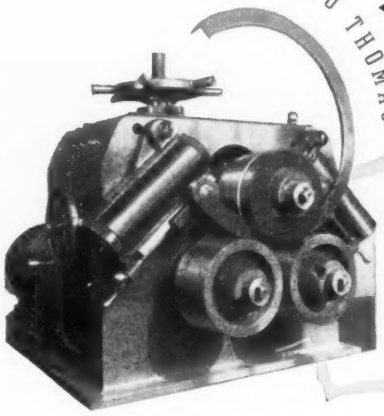

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PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Feb. 5, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Feb. 5	$37.33
Jan. 29	35.50
Jan. Avg.	34.10
Feb. 1957	53.41
Feb. 1953	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	31.00-32.00
No. 1 dealer bundles	*34.00-35.00*
No. 2 bundles	29.00-30.00
No. 1 busheling	*34.00-35.00*
No. 1 factory bundles	*38.00-39.00*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	*24.00-25.00*
Cast iron borings	21.00-22.00
Cut structurals:	
2 ft and under	*38.00-39.00*
3 ft lengths	*37.00-38.00*
Heavy turnings	*32.00-33.00*
Punchings & plate scrap	*37.00-38.00*
Electric furnace bundles	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Stove plate	*39.00-40.00*
Unstripped motor blocks	26.00-27.00
Clean auto cast	42.00-43.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Angles, splice bars	46.00-47.00
Rails, rerolling	56.00-57.00

Stainless Steel Scrap

18-8 bundles & solids	195.00-200.00
18-8 turnings	95.00-100.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

CLEVELAND

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	21.00-22.00
No. 1 factory bundles	*31.00-32.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*31.00-32.00*
Machine shop turnings	11.00-12.00
Short shovel turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut foundry steel	*36.00-37.00*
Cut structurals, plates 2 ft and under	*39.00-40.00*
Low phos. punchings & plate	*32.00-33.00*
Alloy free, short shovel turnings	19.00-20.00
Electric furnace bundles	*32.00-33.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Charging box cast	*36.00-37.00*
Heavy breakable cast	*34.00-35.00*
Stove plate	*41.00-42.00*
Unstripped motor blocks	*26.00-27.00*
Brake shoes	*34.00-35.00*
Clean auto cast	*45.00-46.00*
Burnt cast	*31.00-32.00*
Drop broken machinery	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
R.R. malleable	*59.00-60.00*
Rails, 2 ft and under	*57.00-58.00*
Rails, 18 in. and under	*58.00-59.00*
Rails, random lengths	*50.00-51.00*
Cast steel	*47.00-48.00*
Railroad specialties	*51.00-52.00*
Uncut tires	*41.00-42.00*
Angles, splice bars	*51.00-52.00*
Rails, rerolling	*56.00-57.00*

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	*35.00-36.00*
Machine shop turnings	13.00-14.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	*37.00-38.00*
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*

CHICAGO

No. 1 heavy melt., indus.	*40.00-41.00*
No. 1 hvy melt., dealer	*37.00-38.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 factory bundles	*39.00-40.00*
No. 1 dealer bundles	*37.00-38.00*
No. 2 bundles	24.00-25.00
No. 1 busheling, indus.	*40.00-41.00*
No. 1 busheling, dealer	*37.00-38.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*22.00-23.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	*22.00-23.00*
Cut structurals, 3 ft	*45.00-46.00*
Punchings & plate scrap	*46.00-47.00*

Cast Iron Grades

No. 1 cupola	42.00-43.00
Stove plate	37.00-38.00
Unstripped motor blocks	33.00-34.00
Clean auto cast	*46.00-47.00*
Drop broken machinery	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*
R.R. malleable	*54.00-55.00*
Rails, 2 ft and under	*57.00-58.00*
Rails, 18 in. and under	*58.00-59.00*
Angles, splice bars	*52.00-53.00*
Axles	*54.00-55.00*
Rails, rerolling	*54.00-55.00*

Stainless Steel Scrap

18-8 bundles & solids	160.00-165.00
18-8 turnings	85.00-90.00
430 bundles & solids	90.00-100.00
430 turnings	47.50-52.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*26.00-27.00*
Machine shop turnings	*9.00-10.00*
Mixed borings, turnings	*10.00-11.00*
Short shovel turnings	*11.00-12.00*
Punchings & plate	*29.00-30.00*

Cast Iron Grades

No. 1 cupola	*29.00-30.00*
Stove plate	*25.00-26.00*
Charging box cast	*24.00-25.00*
Heavy breakable	*24.00-25.00*
Unstripped motor blocks	*16.00-17.00*
Clean auto cast	*33.00-34.00*
Malleable	*32.00†*

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	32.00
No. 2 heavy melting	29.00
No. 1 bundles	32.00
No. 2 bundles	22.00†
No. 1 busheling	32.00†
Machine shop turnings	*18.00*
Short shovel turnings	*20.00*

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	32.00
Heavy breakable cast	32.00
Unstripped motor blocks	32.00
Clean auto cast	44.00
Stove plate	39.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00*
Rails, 18 in. and under	51.00
Rails, random lengths	*46.00*
Rails, rerolling	*53.50*
Angles, splice bars	*47.50*

†Nominal

PHILADELPHIA

No. 1 heavy melting	38.50
No. 2 heavy melting	35.00
No. 1 bundles	38.50
No. 2 bundles	28.00
No. 1 busheling	38.50
Electric furnace bundles	*40.00*
Mixed borings, turnings	22.50†
Short shovel turnings	24.00†
Machine shop turnings	22.00†
Heavy turnings	*34.00†*
Structurals & plate	*41.00-42.00*
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	40.00
Malleable	*58.00*
Drop broken machinery	49.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*24.00-25.00*
Machine shop turnings	11.00-12.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plate)	45.00-46.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Unstripped motor blocks	32.00
Heavy breakable	32.00-33.00

Stainless Steel

18-8 sheets, clips, solids	*140.00-150.00*
18-8 borings, turnings	50.00
410 sheets, clips, solids	60.00-65.00
430 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*18.00-18.50*
No. 1 busheling	*25.50-26.50*
Machine shop turnings	9.50-10.00†
Mixed borings, turnings	9.50-10.00
Short shovel turnings	11.00-11.50†
No. 1 cast	29.00-30.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

BUFFALO

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Mixed borings, turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Short shovel turnings	15.00-16.00
Cast iron borings	14.00-15.00
Low phos.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	39.00-40.00
Rails, 3 ft and under	46.00-47.00
Railroad specialties	33.00-34.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	*24.50-25.50*
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	15.00-16.00
Short shovel turnings	*17.00-18.00*
Cast iron borings	15.00-16.00
Low phos. 18 in.	36.00-37.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Heavy breakable cast	33.00-34.00
Charging box cast	33.00-34.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00-35.00*
Rails, 18 in. and under	*54.00-55.00*
Rails, random lengths	*44.00-45.00*

BIRMINGHAM

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	26.00-27.00
No. 1 bundles	31.00-32.00
No. 2 bundles	17.00-18.00
No. 1 busheling	31.00-32.00
Cast iron borings	12.00-13.00
Machine shop turnings	*23.00-24.00*
Short shovel turning	*24.00-25.00*
Bar crops and plates	*39.00-40.00*
Structurals & plate	39.00-40.00
Electric furnace bundles	36.00-37.00
Electric furnace:	
2 ft and under	35.00-36.00
3 ft and under	34.00-35.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Stove plate	*49.00-50.00*
Unstripped motor blocks	39.00-40.00
Charging box cast	22.00-23.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R. R. heavy melt.	*35.00-36.00*
Rails, 18 in. and under	*49.00-50.00*
Rails, rerolling	*45.00-46.00*
Rails, random lengths	*42.00-43.00*
Angles, splice bars	42.00-43.00

SEATTLE

No. 1 heavy melting	*28.00*
No. 2 heavy melting	*26.00*
No. 1 bundles	*22.00*
No. 2 bundles	21.00
Machine shop turnings	*18.00*
Mixed borings, turnings	22.00
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	*32.00*
No. 2 heavy melting	*31.00*
No. 1 bundles	*28.00*
No. 2 bundles	*21.00*
Machine shop turnings	12.00
Shoveling turnings	15.00
Cast iron borings	15.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft.	40.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

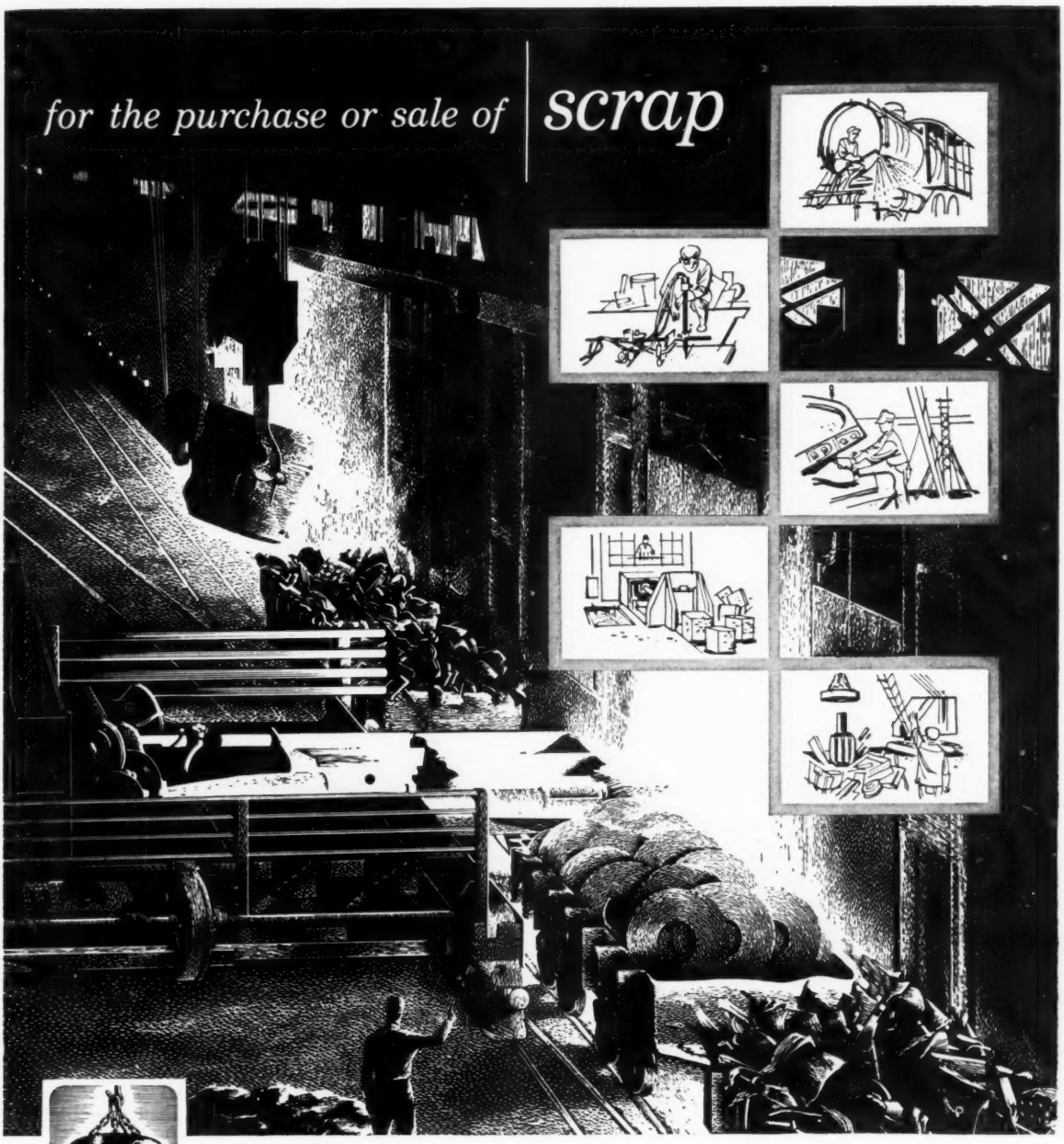
No. 1 heavy melting	32.00
No. 2 heavy melting	27.00
No. 1 bundles	32.00
No. 2 bundles	22.00
Mixed steel scrap	27.00
Mixed borings, turnings	17.00
Busheling, new factory:	
Prepared	32.00
Unprepared	26.00
Short steel turnings	21.00

Cast Iron Grades†

No. 1 machinery cast	45.00-50.00

†F.o.b. Hamilton, Ont.

for the purchase or sale of | *scrap*



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Plan Lead, Zinc Study

Producers are setting up long range research project to seek new applications, improve old ones. Metal sales continue to lag. Copper and lead prices could go lower

Nonferrous Metal Prices, Pages 142 & 143

LEAD AND ZINC industry officials are readying a stepped up research program to pump new blood into their product lines. Faced with more capacity than demand, and shrinking sales in some traditional areas, they plan a two-pronged program that will: 1. Expand existing markets through improved products. 2. Pioneer new uses for the two metals.

Partnership — Members of the American Zinc Institute Inc. and Lead Industries Association will work with overseas producers on a series of basic and applied research problems. Plans call for projects to be set up at independent research centers, universities, and engineering schools (in the U. S. and abroad) over an indefinite period.

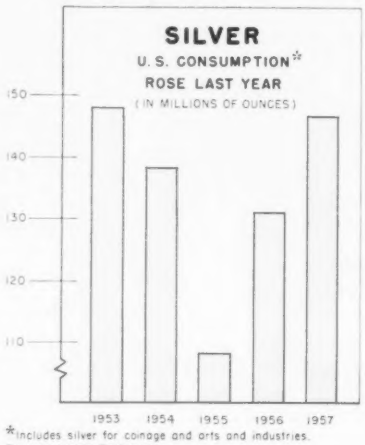
Specific goals haven't been announced. But it's felt a good share of the program will be devoted to studying such existing markets as diecastings, galvanizing, paints, and pigments, and cathodic protection.

Dollars—There's no official word on the cost of such a program. Best guess is the yearly tab will run $500,000 to $1 million.

Any method of stimulating business will be welcomed by both industries. Sales are running below the low levels of December and January. Producers do not believe this will result in a further zinc price reduction, though. Reason: Sales probably wouldn't be affected enough to make such a move profitable.

Lead's a different story. The price could dip from the 13 cents a pound level at any time—most observers are surprised it hasn't fallen already.

Stocks—Zinc's biggest problem is still too much production. Producers entered 1958 holding 166,655 tons of slab, the highest stocks have been since 1953. To help counteract the upward trend, two more companies have curtailed operations: 1. Bunker Hill Co. has reduced the workweek at some of its mines to four days. 2. Blackwell Zinc Co. Inc. plans to cut operations by about 2000 tons a month on Feb. 22.



*Includes silver for coinage and arts and industries.
Source: Handy & Harman.

Metal Potpourri

The entire nonferrous industry continues in a slump with no signs of early improvement.

Copper—Sales, if anything, are worse. Metalmen say custom smelters momentarily may lower the 24 cents a pound price. They point out dealers are offering the red metal at less than 24 cents. Production curtailments continue. Latest announcement is by the Rhodesian Anglo-American group which plans to trim output by 10 per cent (27,000 tons yearly) beginning in March.

Aluminum—Shipments of both pig and mill products are down. Producers admit sales so far in 1958 have been under expectations, especially to such large consuming industries as construction and autos.

Magnesium — The Magnesium Association reports ingot shipments in 1957 hit 78,865 tons, compared with 68,347 tons in 1956. But wrought products dropped to 11,510 tons from the 12,692 tons registered in 1956. Sales are disappointing this year.

Nickel—Customers are buying spasmodically as they continue working off inventories. It's reportedly impossible to move premium price grades. Surpluses of market price nickel are growing.

Titanium—The industry is operating at 40 to 50 per cent of capacity. Producers are getting more nibbles from chemical firms, but these aren't being translated into orders yet. Some pickup is noted in sales of flat-rolled products to aircraftmakers.

Silver—U. S. consumption rose last year (see chart) due to more demand from the government for coinage material, reports Handy & Harman, New York. World consumption was up, too: 289 million ounces, compared with 272.6 million ounces in 1956.

NONFERROUS PRICE RECORD

	Price Feb. 5	Last Change	Previous Price	Jan. Avg	Dec. Avg	Feb., 1957 Avg
Aluminum ..	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	24.00-25.00	Jan. 21, 1958	24.50-25.00	25.135	26.130	32.863
Lead	12.80	Dec. 2, 1957	13.30	12.800	12.800	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	93.50	Feb. 5, 1958	93.125	92.933	92.395	101.159
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.50-26.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-90 per lb, nom.

Copper: Electrolytic, 25.00 deld.; custom smelters, 24.00; lake, 25.00 deld.; fire refined, 24.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-90 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $220-225 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $74-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.50 per lb, commercial grade.

Silver: Open market, 88.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 93.50; prompt, 93.125.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.25-25.50; No. 12 foundry alloy (No. 2 grade), 21.25-23.25; 5% silicon alloy, 0.60 Cu max., 25.00-26.25; 13 alloy, 0.60 Cu max., 25.00-26.25; 195 alloy, 24.25-27.00; 108 alloy, 21.75-23.25. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.25; grade 2, 21.50; grade 3, 20.25; grade 4, 18.25.

Brass Ingot: Red brass, No. 115, 25.75; tin bronze, No. 225, 34.50; No. 245, 29.25; high-leaded tin bronze, No. 305, 29.75; No. 1 yellow, No. 405, 21.25; manganese bronze, No. 421, 23.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53; l.c.l., 33.28. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; Plate, $12.50-19.20; H.R. strip, $12.50-22.90;

ZIRCONIUM

C.R. strip, $15.00-31.25; forged or H.R. bars, ribbon zinc in coils, 20.50; plates 19.00, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	44.40	51.20
6061-T6	46.90	53.00
2024-T4	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, random lengths: 2014-F, 46.90-53.90, diam. 1-8 in.; 6061-F, 43.50-53.90, diam. 1-6 in.; 7075-F, 63.50-73.90, diam. 1-3.875 in.; 7079-F, 68.50-78.90, diam. 1-3.875 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13b	45.36c	....	48.32	21.000	21.000	20.250
Yellow Brass	42.69	31.03d	43.23	45.60	16.125	15.875	14.500
Low Brass, 80%	44.90	44.84	45.44	47.71	17.875	17.625	17.125
Red Brass, 85%	45.67	45.61	46.21	48.48	18.625	18.375	17.875
Com. Bronze, 90%	46.98	46.92	47.52	49.54	19.250	19.000	18.500
Manganese Bronze	50.73	44.91	55.44	....	15.000	14.750	14.125
Muntz Metal	45.19	41.00	....	....	15.125	14.875	14.375
Naval Brass	47.07	41.38	54.13	50.48	14.875	14.625	14.125
Silicon Bronze	52.84	52.03	52.88	58.18	20.625	20.375	19.625
Nickel Silver, 10%	57.93	60.26	60.26	....	21.125	20.875	10.562
Phos. Bronze, A-5%	67.17	67.67	67.67	68.85	21.875	21.625	20.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 17.00-17.50; No. 2 heavy copper and wire, 15.00-15.50; light copper, 13.00-13.50; No. 1 composition red brass, 14.50-15.00; No. 1 composition turnings, 13.50-14.00; new brass clippings, 12.50-13.00; light brass, 8.50-9.00; heavy yellow brass, 11.00-11.50; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 11.00-11.50; cocks and faucets, 11.50-12.00; brass pipe, 12.00-12.50.

Lead: Heavy, 8.25-8.75; battery plates, 3.50-3.75; linotype and stereotype, 10.50-11.00; electrotype, 9.50-10.00; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.00-16.25; 3003 clippings, 16.00-16.25; 6151 clippings, 15.50-16.25; 5052 clippings, 15.50-15.75; 2014 clippings, 15.00-15.75; 2017 clippings, 15.00-15.75; 2024 clippings, 15.00-15.75; mixed clippings, 14.50-14.75; old sheets, 12.25-12.50; old cast, 12.25-12.50; clean old cable (free of steel), 15.25-15.50; borings and turnings, 12.75-13.75. **Beryllium Copper:** Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 19.50; No. 2 heavy copper and wire, 17.50; light copper, 15.25; refinery brass (60% copper) per dry copper content, 17.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 19.50; No. 2 heavy copper and wire, 17.50; light copper, 15.25; No. 1 composition borings, 16.50; No. 1 composition solids, 17.00; heavy yellow brass solids, 11.50; yellow brass turnings, 10.50; radiators, 13.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 41.79; oval, 40.00, 5000-10,000 lb; electrodeposited, 31.25, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 10-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 109.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums. **Chromic Acid:** 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 71.60; 300-900 lb, 69.60.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: Less than 400 lb, 35.00; 400-9999 lb, 33.00; 10,000 lb, 32.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.70; 100-600 lb, 65.80; 700-1900 lb, 63.00; 2000-9900 lb, 61.20; 10,000 lb or more, 59.80.

Stannous Chloride (anhydrous): Less than 25 lb, 164.10; 25 lb, 129.10; 100 lb, 114.10; 400 lb, 111.60; 5200-19,600 lb, 99.40; 20,000 lb or more, 87.20.

Stannous Sulphate: Less than 50 lb, 126.90; 50 lb, 96.90; 100-1900 lb, 94.90; 2000 lb or more, 92.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 137)

work and public utility needs seem to be the principal factors bolstering the market.

Sheared carbon plates are in easy supply, though less so than most other tonnage items. On an average, they can be had for delivery in four weeks, but, in some cases, two and three week shipments are offered. Strip plate is available in still shorter time. So is universal plate.

Plate mill schedules are filling slowly for March. In New England, only ship requirements are holding up. Weldment volume is down. So is that for tanks. Shops fabricating paper mill equipment are not much interested in additional tonnage. District shops, though, are estimating more bridge tonnage.

Demand from the construction industries is still slipping. Road building needs have not come out to give the market a shot in the arm, but they will soon. Railroad equipment demands are sliding off.

Users are working off topheavy inventories, and most of them are not expected to return to the market as active buyers until well into the second quarter.

Pig Iron . . .

Pig Iron Prices, Page 132

Foundry operations have shrunk further to a rate estimated at only 50 per cent and additional loss of ground in the current month is feared. Some gray iron foundries are working only two to four days a week; others continue to operate five days a week, but at reduced hours per day.

Order backlogs are at a minimum, shop activity being geared to day-to-day orders for castings. Shipments of merchant iron have been moving a shade faster in some districts, however, due to the prospective increase in freight rates of 40 cents a ton on Feb. 15. The gain in shipments does not reflect any gain in actual consumption.

The base freight rate on coke will be advanced 15 cents; on coal, 8 cents. With about 1½ tons of coal required for the production of a ton of coke, the cost of producing coke will be increased 12 cents. However, coke producers say this increase in their cost will not be passed along to foundries at this time. In other words, the foundries will be stuck for only the 15-cent increase in the base rate on coke.

Mystic iron is being barged down to Philadelphia from Everett, Mass., for marketing in that area by Debevoise-Anderson Co., which until the first of the year had been handling Swedeland, Pa., iron. It is being stocked at the plant of the Philadelphia Coke Co., an affiliate (along with Mystic Iron Works Div.) of Eastern Gas & Fuel Associates, Boston. The material is priced to meet competition in the Philadelphia district.

Tin Plate . . .

Tin Plate Prices, Page 129

Tin plate heads the list of steel products that are doing well, and a good first half seems assured for producers. Some of the tin mills are operating at capacity.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 133

Inland Steel Co. recently started up its second new coke battery in two years. It lighted the first oven in its No. 8 battery (87 ovens) at its Indiana Harbor (Ind.) Works. The new battery replaces No. 4, a 31 year old, 74 oven unit.

New No. 12 battery of the Clairton Works, U. S. Steel Corp., has begun pushing coke. Twenty coke batteries at this U. S. Steel plant have been rebuilt since World War II. Only three of the plant's original batteries are left in operation.

Canada . . .

Production of primary iron and steel shapes in Canada during October totaled 430,135 net tons, against 411,898 in September and 578,548 in October, 1956. The total included 122,193 tons delivered as producers' interchange for further processing within primary plants.

Shipments for sale during October were 302,608 tons, compared with 288,300 in September and 389,248 in October, 1956.

Demand for steel continues to decline in Canada, and the outlook provides no promise of an early change in market conditions.

Dominion Steel & Coal Corp. reports it is operating only four of six open hearths at Sydney, N. S.

STEEL EXECUTIVE

Unusual position available to executive thoroughly experienced in steel price structure, steel pricing methods and policies, as practiced in an integrated steel company. Challenging opportunity to apply this background in the study and installation of a similar structure in another industry. Require broad experience at policy-making level. We prefer permanent employment but will consider consulting arrangement. Reply, giving complete details of qualifications to Box 636, STEEL, Penton Bldg., Cleveland 13, Ohio.

WE OWN and OFFER FOR SALE
OVERHEAD CRANES

CAPACITY	NAME	SPAN	LIFT
10	Shaw	47′	15′
15	Shaw	67′	26′
150 **	N B P	75′	40′
20 *	N B P	71′ 10″	25′ 6″
150 **	Shepard Niles	100′	39′
40 ***	Harnischfeger	98′ 10″	40′ 8″
20 *	Shepard Niles	98′ 10″	27′
20 *	Shaw	96′	27′
20 *	Shepard Niles	96′	28′
20 *	Shepard Niles	96′	26′
50 ****	Shepard Niles	100′ 6″	25′
20 *	P & H	100′ 6″	24′ 9″

* 20T. bridge with (2) 10 T. trolleys
** 150 T. bridge with only (1) 75 T. trolley (add'l. 75 T. trolleys may be available)
*** 40 T. bridge with (2) 20 T. trolleys
**** 50 T. bridge with (2) 25 T. trolleys

10	Niles	64′ 8″	23′
10	Shaw	64′ 8″	22′
10	N B P	52′	19′
10	P & H	52′	19′
75 †	Shaw	75′	36′

† 150 T. bridge with only (1) 75 T. trolley which has 10 t. auxiliary

All cranes 250 Volts—D.C.

ALL IN EXCELLENT OPERATING CONDITION
MAY BE INSPECTED IN OPERATION
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We also offer 2000′ each of 24″ and 43½″ Crane Runways in 18′ lengths, with columns

HERMAN H. SCHWARTZ CO.
1776 CLINTON AVE. NO., ROCHESTER 21, N. Y.

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MR. DAVIS	—	SCHENECTADY, N. Y.	— DIckens 6-8421

CHIEF PRODUCTION ENGINEER

To take complete charge of Production Engineering Department of progressive alloy fabrication plant located in western New York. Must be thoroughly experienced in the fabrication of alloy equipment, particularly reactors, columns, heat exchangers, etc. Complete understanding of ASME code regulations as applied to pressure vessels necessary. Position involves the supervision of 35 to 40 persons and responsibility of all Production Engineering work in the Division. Applicant must have at least a ME Degree with a minimum of 10 years engineering experience in the fabricating field. An important factor in the final selection of the candidate will be proven administrative ability. Age bracket 35 to 45. Please answer to Box 637, STEEL, Penton Bldg., Cleveland 13, Ohio, giving all pertinent information. Replies held confidential.

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CLASSIFIED

Help Wanted

SALES ENGINEER

Long established and well known eastern Forge Shop and Steel Foundry specializing in open die forgings and heavy steel castings desires to employ Sales Engineer for Eastern District Office. Applicant should be between the ages of 27 and 35, college education preferred and with some sales experience in forging and casting industry or allied fields. Successful applicant for this very desirable position will be given several months training at plant before assuming position in the field. Write Box No. 634, STEEL, Penton Bldg., Cleveland 13, Ohio.

GENERAL SUPERINTENDENT

Small, financially strong Ohio steel plate and alloy fabricating plant with long record of profitable operation has opening for man of highest type. Permanent position with unlimited opportunity for growth. Must be thoroughly experienced in code welding practice, maintenance costs and general shop procedure. Enclosed photograph and give full experience with references and salary bracket expected. Only fully qualified with no fear of hard work need apply. All replies strictly confidential. Write Box No. 635, STEEL, Penton Bldg., Cleveland 13, Ohio.

LOOKING FOR SURPLUS MACHINERY?

By checking the classified pages of STEEL each week you'll be able to find many different types of equipment which will fit your requirements. Used or surplus equipment—you can best find it in STEEL's classified columns.

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If your supplier neglects any one of nine important steps in the production of stainless steel plate his product may not be a bargain for you.

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- Rigid inspection of work throughout entire production cycle.
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AT MODERATE COST

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We are working with many companies right now on idea modernization for butt weld, seamless, stretch reducing, continuous galvanizing, continuous annealing, electrolytic tinning, stainless processing, silicon processing, cold drawing, rubber, plastic and chemical.

A discussion of your ideas and plans may show how you can modernize at moderate cost.

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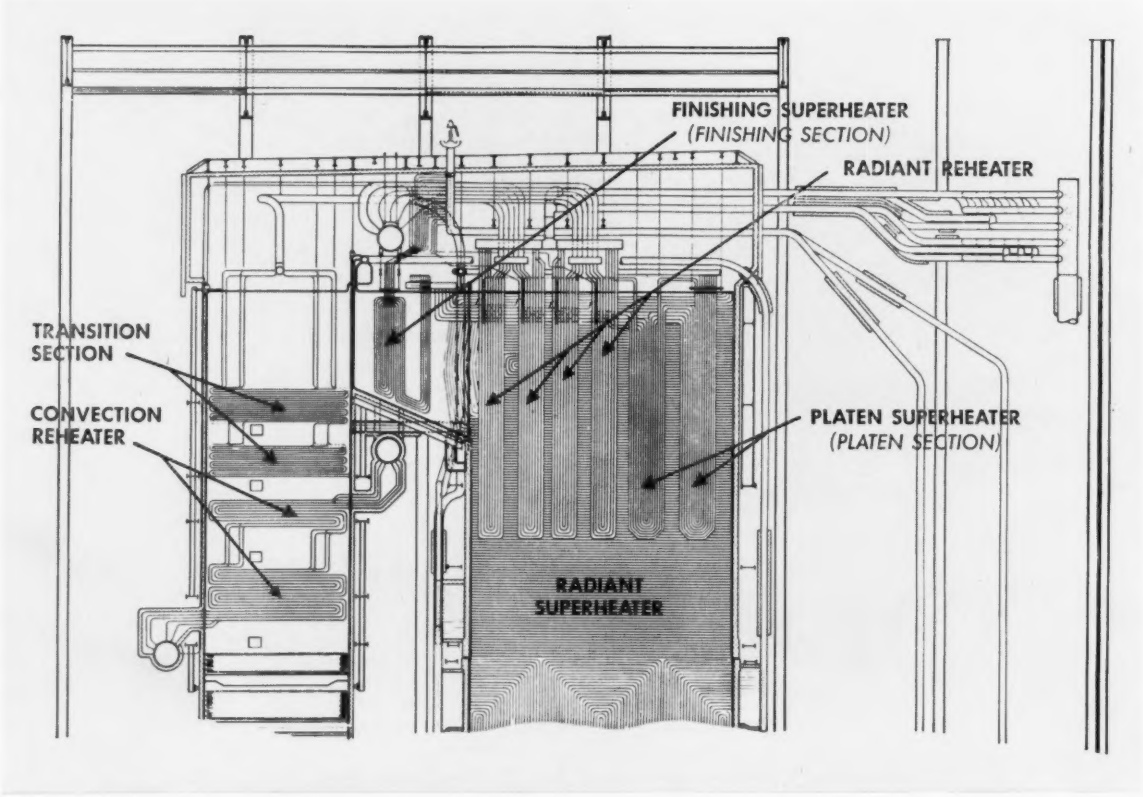

Philadelphia Electric sets new record for steam pressure-temperature *using Timken® seamless steel tubes*

COMBUSTION ENGINEERING CO., had the job of designing and building a steam generator for a revolutionary new power plant for Philadelphia Electric. They had to harness the highest combination of pressure-temperature ever achieved with steam—5,000 psi and 1,200° F.

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And now you can get Timken® heavy wall seamless tubes up to 11″ O.D. x 3¼″ wall. It's available in all the popular low and intermediate alloy steels and austenitic stainless grades—304, 316, 321, 347 and other special analyses. This gives designers a broad range of high temperature strength together with the required degree of corrosion and oxidation resistance. And delivery is within normal mill lead times.

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